



CITY OF
CINCINNATI

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APPENDIX I

CONSTRUCTION MANAGEMENT MANUAL

**CITY OF CINCINNATI
DEPARTMENT OF TRANSPORTATION & ENGINEERING**

**CONSTRUCTION MANAGEMENT SECTION
CONSTRUCTION
MANAGEMENT
MANUAL**

March 2000



To all Construction Management Manual users:

I am pleased to provide each of you with this Manual for your use in administering City of Cincinnati construction contracts. The Manual represents a current compilation of collective experiences and good practices that have accumulated during the years of managing the development of the City of Cincinnati's infrastructure.

The Manual provides guidance in several key areas. Guidance is provided on effective means of managing the field construction operations. Equally important, the Manual addresses record keeping and field administrative procedures that are essential in achieving cost effective projects with clear audit trails. All of us involved in executing the City of Cincinnati construction program, including planners, designers, construction managers and inspectors, safety, quality assurance, accounting, legal and public relations staff, must perform our jobs with professionalism, integrity and excellence.

Diligent application of the Manual's guidance will ensure attainment of the high quality, cost effective and timely construction expected by our citizens. Please follow the procedures and utilize the forms contained in the Manual in administering your contracts.

As you use this Manual in your day-to-day work, be alert for ways to improve the Manual. Your comments on refinements to the Manual will be welcome. We will update the Manual as required based upon information received from field, design, planning, accounting staff and others involved in the construction process.

*Donald W. Rosemeyer, P.E.
City Engineer, Department of
Transportation & Engineering*

Statement from the Construction Management Principal Engineer

A primary goal of the Construction Management Section is to provide consistently high quality in the construction management of City of Cincinnati projects. This Construction Management Manual will assist members of the Construction Management Section in achieving that goal by providing helpful information in the form of text, organization charts and sample forms and documents. The text gives general guidance and is supplemented by specific formats of documents to be used in managing City construction projects. Compliance with the comprehensive guidance in the CM Manual will allow us to manage and document assigned construction projects to the high standards we seek.

*Donald G. Gindling, P.E.
Principal Engineer
Engineering / Construction Management*

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Introduction

A Construction Management (CM) organization must adopt standard operating procedures in order to promote uniformity and efficiency. The CM staff must coordinate with others who provide services that include planning, budgeting, pre-design services, design services, scheduling, bid and award services. The project may include multiple construction contracts. The use of consistent CM practices as provided in this Manual will be beneficial.

Construction Engineering and Inspection

Construction engineering and inspection services provided during the construction phase of a project will usually include monitoring of the construction work through inspection and testing, monitoring progress against the construction schedule, checking and recommending interim and final payments, administration of changes, maintaining and filing records for audits, and providing documentary records that the project has been built in accordance with plans and specifications. The management will usually include a Construction Engineer (CE) who will be supported by inspectors. Depending upon the size of the project, it may be desirable to expand the staff to include secretarial/administrative staff, an office engineer, and a Chief Inspector. The CE and staff may supervise several projects.

Organization charts follow which show the Engineering/Construction Management organization and normal and expanded service staffs. The purpose of this manual is to provide guidance to the CE and field staff, and other City of Cincinnati offices in the procedures to be implemented in the administration of the construction phase of a project. This Construction Manual has been structured to meet the needs of the City staff in a variety of types and sizes of construction projects.

Role and Responsibility of the Construction Engineer

The CE's primary function should be to observe and monitor (but not to certify or ensure) that:

The project is built in accordance with the plans and specifications and in accordance with sound engineering and construction practices.

- a. The Contractor's work is being completed in accordance with the approved schedule and within budget.
- b. All claims and changes are properly defined and documented.

The contract is administered in a fair and equitable manner and contractual actions are accurately and completely documented.

The Construction Engineer is responsible to administer the contract once it is awarded. However, before award, the CE should assist in constructibility review, final bid document review, pre-bid conference, review of bids received and attend pre-award meetings. The CE is responsible to follow the practices and procedures of this Manual where applicable and feasible.

A Construction Management organization must adopt standard operating procedures in order to promote uniformity and efficiency.

Job Descriptions

This Construction Management Manual describes the duties involved in the construction management of projects. It recognizes that for expanded service, the Construction Engineer will be supported by additional staff. These expanded staffs consist of Office Engineer, Administrative Assistant, Chief Inspector, Inspectors and others depending on the size and complexity of the project. The following job descriptions cover the normal range of duties of Project Managers, Construction Engineer, Office Engineer, Administrative Assistant, Chief

Inspector and Construction Inspector. These job descriptions are not a complete list of duties and responsibilities and all construction management staff should recognize that every project will be different to some degree and will require flexibility in the procedures and responsibilities in adapting them to a particular project. For normal service projects, the Construction Engineer and Construction Inspector are responsible for all these duties where applicable and feasible.

Project Manager (PM)

The Project Manager is the person that is responsible for the oversight and control of the entire project. The PM is responsible for securing funding, budgeting, planning, scheduling, preparing bid documents, and general oversight of the project from inception to completion. In some cases the PM and the Design Engineer are the same.

Construction Engineer (CE)

The Construction Engineer is the primary contact between the Construction Contractor and the Project Manager (PM). The CE is responsible for the administration of the construction contract to assure to the extent possible that the contract is completed according to the plans and specifications and to the required quality standards, within the contract time allowed for the construction, and within the contract price authorized for the work.

The CE is responsible for monitoring the work of the Contractor to ensure that the work is installed in accordance with an agreed schedule and to ensure that support services from the City of Cincinnati comply with the construction schedule. The CE will receive and resolve, requests for information and clarification of the construction documents and resolution of field conditions that may represent a change to the contract conditions. The CE shall process all requests for changes, either from the Contractor or the PM including any changes in the contract price or time that result from changes.

The CE is responsible for responding professionally, timely, and courteously to concerns about the construction from the public, city administration, and City Council. The CE is expected to take reasonable steps to minimize the impacts of construction on the affected residents, travelers, and businesses including meetings attendance and written/oral communications.

The CE is responsible for checking all payments for the work through interim and final payments and shall maintain a comprehensive document record of all quantities and payments made. This will include quantities and payments for any changes in the work. The document record shall include all supporting documents required for payment such as, material certifications, affidavits for payments to subcontractors and suppliers, insurance certificates and invoices for stored materials.

The CE is responsible for monitoring the quality of the work installed to confirm that it meets the Specifications and industry quality standards. This will include processing of shop drawings and other submittals, monitoring of all testing both on-site and off-site, observation of the work being installed and gathering of certifications, warranties, and guarantees. The CE shall record all non-conforming work and completion of corrective action.

The CE is responsible for monitoring conformance by the Contractor with contractual and for safety and shall bring all observed violations to the attention of the Contractor. The CE is not responsible for safety of the work, but shall require correction of serious situations observed and shall stop work that poses a serious and imminent danger to life or substantial property damage.

The CE is responsible for monitoring the work of others assigned to assist the CE in the administration of construction contracts and shall ensure that they perform their duties as required. The CE shall provide assistance and guidance as necessary so as to promote a team environment and a positive work experience. The CE shall perform periodic reviews of the work of the CE staff and shall advise the staff of the results of the reviews and shall monitor the implementation of any corrective action.

The CE is responsible for regular and timely reporting to the PM on the progress of the work. The CE shall promptly report any major deviations from the schedule, the contract price, or the quantity of the work to the PM. All accidents requiring medical attention or property damage shall be immediately reported to the city administration. Any visits by the media shall be immediately reported to the Construction Principal Engineer (CPE), who is responsible to report it to the City Engineer. The CE shall inform the CPE of any adverse incidents that will require their attention or involvement for resolution. The CE shall report any staff situations that may require special attention to the CPE.

Office Engineer (OE) where used to assist the CE.

The Office Engineer supports the Construction Engineer on construction projects and is responsible for the technical areas of the project.

The OE is responsible to set up and maintain the project files. The OE is responsible for developing lists of submittals for the project and for receiving, distributing to the PM for review, expediting review and timely return to the Contractor of all submittals required by the contract. The OE shall maintain a log of all submittals and re-submittals.

The OE is responsible for collecting and recording quantities, receiving and checking payment applications and all supporting documents, and expediting timely processing of payment applications. The OE shall maintain records of all quantities, changes, and payments made and shall continuously reconcile quantities and payments with the contract documents.

The OE shall attend Progress Meetings and shall provide minutes in accordance with procedures. The OE shall provide and maintain logs of requests for information, change requests and submittals and shall attach up-dates of these logs to the meeting minutes.

The OE shall receive and process all requests for information and changes and shall expedite and document this process. The OE with the CE will determine where the response to RFI will come from and expedite. Any changes from the RFI will be processed through change documentation.

The OE shall monitor all testing and shall maintain all records of testing, certification and all other quantity records. The OE shall notify the PM of quantity/testing issues and monitor and document resolution.

Administrative Assistant (AA)

The Administrative Assistant will provide secretarial and administrative support to the CE and his staff. The AA will cover the telephones at the Field Office and maintain telephone logs. The AA will maintain all contract files. The AA will receive, date stamp and log all incoming correspondence and copy and distribute according to procedures. The AA will be responsible for logging and mailing all out-going correspondence.

The AA will provide typing support to the field staff for correspondence. This will include general correspondence, meeting minutes, letters of transmittal, weekly/monthly reports, inspectors' daily reports, and other documentation. The AA will maintain the field office supplies and process all invoices.

Chief Inspector (CHI) where used to assist the CE

The Chief Inspector will be responsible for supervision of field inspection staff. The CHI shall attend progress meetings, review overall and interim construction schedules, and coordinate the placement of field inspectors with the contractors operations. The CHI will ensure that field inspectors are familiar with the work, the requirements of the contract and documentation required.

The CHI will instruct the field inspectors in taking and recording quantities, checking and verifying layout, observing the work and maintaining daily reports. The CHI will periodically review specifications, procedures, and testing requirements with the field inspectors. The CHI will review each Inspector Daily Report (IDR) for accuracy and countersign the report. The CHI will forward IDRs to the OE for quantity checking and take-offs, then to the AA for filing.

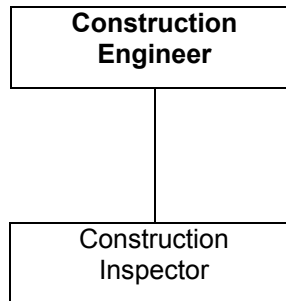
The CHI will coordinate between field inspectors and contractor superintendents to maintain coverage of the work being installed and testing to be observed. The CHI will confer with the inspector on non-conforming work and will determine with the CE when Non-Conformance Notices are to be issued.

The CHI will keep the CE informed of unresolved deficiencies in the work, general quality standards, relationships with Contractors, drawing deficiencies, conflicts and changed conditions. The CHI will note observations of safety infractions and make sure they are reported to the Contractors and to the CE.

Construction Inspector (CI)

The Construction Inspector works under the direction of the Construction Engineer. The CI is responsible to perform inspection of a construction contractor's work, as assigned by the CHI or CE; to assure the work is in compliance with approved contract plans and specifications. The CI observes the contractor's work and recommends approval of the inspected work to the CHI or CE based upon tests conducted in accordance with published procedures and good construction practices. The CI maintains inspection records and records pertinent data regarding equipment, material, and labor. The CI prepares daily inspection reports and keeps the CHI or CE advised of inspection results, particularly items requiring re-work because of quality deficiencies. The CI will verify and maintain on a daily basis quantity data for use in processing progress payments. For projects with limited service staffs, the CI will assume additional responsibilities as assigned by the CE. Comply with the duties and responsibilities as per the PWI and PWII job descriptions and the Construction Inspector Manual.

CONSTRUCTION ENGINEERING AND INSPECTION (CEI) ORGANIZATION CHART



Note:

The number of inspectors assigned varies with the size and scope of the construction contract being inspected.

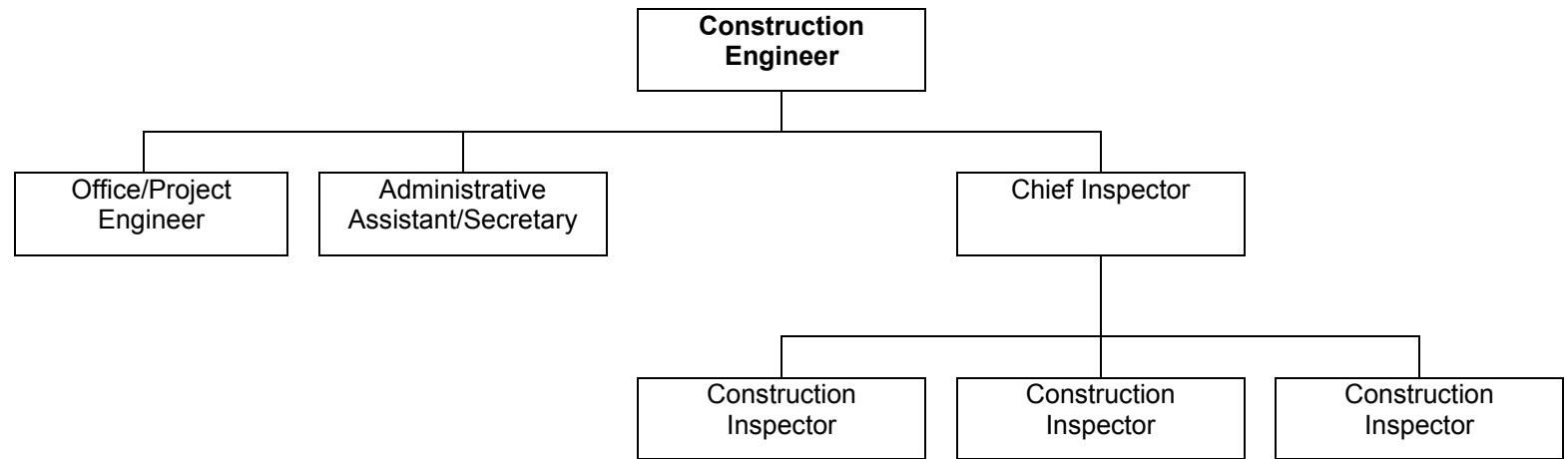
Construction Engineer is defined by a Principal Engineer, Supervising Engineer, Senior Engineer, or EIT assigned to manage a construction project.

Construction Inspector is defined as a Public Works Inspector 1 or 2 or a consultant inspector.





CONSTRUCTION ENGINEERING AND INSPECTION (CEI) EXPANDED ORGANIZATION CHART



Note:

The number of inspectors assigned varies with the size and scope of the construction contract being inspected.

Construction Engineer is defined by a Principal Engineer, Supervising Engineer, Senior Engineer, or EIT assigned to manage a construction project.

Construction Inspector is defined as a Public Works Inspector 1 or 2 or a consultant inspector.

Section 1.0 Pre-bid Procedures

1.1 BID PROCEDURES AND EXECUTION

The normal City of Cincinnati pre-bid process uses the following steps.

1. Two weeks before advertising, a Form 217 is prepared and sent to Contract Compliance.
2. One week prior to advertising the plans and specifications, instructions to bidders, Requisition (Form 1) and sealed Engineer's estimate are sent to the Purchasing Office. Note, City Administrative Regulation forbids any estimate to be revealed before a contract is awarded.
3. A minimum of two weeks before the bid opening date (three weeks for Federal funded highway projects) the contract must be advertised in the City Bulletin. When required, the contract is also advertised in the local newspaper.
4. A pre-bid conference is held, if necessary, a minimum of 7 days prior to bid
5. Corrections to the bid documents (addendum) must be issued at least five business days prior to bid opening. For bid cancellations or line specific line item deletions least than five days may be permitted.

On occasion and as approved by the City Manager there may be the need to use the City of Cincinnati Emergency Bid Procedures. These steps are as follows:

1. The PM get a letter of authorization to proceed signed by the City Manager's Office.
2. Bid documents are prepared and sent to a minimum of three selected bidders.
3. Bids are received by the PM; a public bid opening is not required.
4. The PM evaluates the bids and sends the bids along with an Engineer's estimate, I.D. requisition, and recommendation to award to the Purchasing Agent.

The CE is not responsible for many of these but should be thoroughly familiar with the Bid and Award procedures, including dates and times of events, conditions for issue of documents and all the requirements and constituents of a responsive bid. Care should be taken to see that Bid Documents, i.e., plans, specifications, soil reports, surveys and other listed items are available at the time, date and location listed in the Notice to Bidders.

Document Logs should be prepared ahead of time to record the time and date of issue; whether full or partial sets; name, title, company, phone number and address of person receiving the documents; fees paid, if any; if mailed, whether US Mail, Fed Ex, USPS, etc. If fees or deposits are required, there must be a clear procedure for receiving, storing, and returning deposits or for receiving fees and accounting for their disposition.

The Document Log should be maintained through the bid period and used to record issues of addenda, if any. The accounting system should record deposits and their transference to treasury and deposit into the correct fund.

Telephone questions should be avoided as far as possible during the bid period. Bidders should be given a name from the A/E staff to handle design-related questions. Telephone callers should be required to submit questions in writing that will require an addendum response. Telephone logs should be maintained to record all calls. All such communications should be copied to the Purchasing Agent.

In distributing addenda to bidders, care must be exercised to ensure those who have obtained the contract documents receive copies of the addenda. Those who have obtained multiple sets of the contract documents should receive an equal number of copies of the addenda. Wherever possible, the distribution system should require acknowledgment of receipt of the addenda. The

Contract Documents distribution log should be used and the issue of each addendum entered in the log.

Failure to acknowledge receipt of addenda is grounds for rejection of a bid. Rejected bidders can be expected to claim that they never received addenda. The record should show that addenda were mailed out to the known plan holders. The bidder is responsible to be aware of all addenda.

1.2 CONSTRUCTIBILITY REVIEW AND PRELIMINARY SERVICE ESTIMATE

When drawings are 50-75 percent complete, a constructibility review should be conducted by the CE. The review will identify problems in constructing the project as designed. Recommendations are provided to the designer on changes that will facilitate construction while retaining the design intent. Other actions taken in conjunction with the review of plans and specifications are a check of bid items and quantities, development of a schedule and sequence of work and a review of right-of-way and utility issues. The CE should make a site visit to review and document existing condition. The CE should prepare and review with the PM a preliminary service estimate.

1.3 FINAL BID DOCUMENT REVIEW

Before Construction Section's Principal Engineer signs off on the title sheet, a thorough review should be made of the final plans and specifications by the CE. This review provides an opportunity to insure that all issues previously identified have been addressed properly. Not only should incorporation of comments on earlier stage document reviews be verified, but also appropriate action taken on other pending issues regarding real estate, utilities, permits, environmental issues, cost estimate compared to available funds and items of concern to abutting property owners and the public. Resolution of these matters before the contract award process begins will reduce significantly the cost and schedule impacts.

1.4 PRE-BID CONFERENCE

The bid procedures will usually include one or more Pre-Bid Conferences. These may or may not be combined with bidders' site inspection. Some contracts will require attendance at the Pre-Bid Conference as a condition of bidding. Mandatory attendance is permitted but should only be used where necessary. The location and facilities of the Pre-Bid Conference should be carefully reviewed for access, availability, space, lighting, sound systems, screens, video players and other media aids. The venue should be visited the day before the Pre-Bid Conference and checked to verify everything is in order. The conduct of the Pre-Bid Conference should be carefully planned. Who will chair the meeting, who will attend, who will speak on which subjects, who will keep minutes and who will answer questions should all be addressed to the PM. An agenda must be prepared and agreed upon and a system utilized that will record subjects or questions that will be covered by a formal, written addendum. A sample Pre-Bid Conference Agenda is included in Appendix 1.

The purpose of the Pre-Bid Conference is to convey a thorough understanding of the project to prospective bidders. The more the bidders understand the project and its conditions, the more intelligent and realistic will be their bids, and the potential for conflict during construction much reduced. To this end, consideration should be given to maximum use of visual aids such as colored and highlighted drawings, aerial photographs; large-scale location maps showing major access routes and restrictions, scale models and three dimensional and CADD graphics, when available.

The Pre-Bid Conference should begin on time, even if people are still arriving. It is important to those who made sure to be on time and will indicate that time and promptness are important to this project. All attendees should be required to sign in and indicate whom they represent. Speakers should balance brevity with clarity in addressing their subjects and should have taken time to prepare their presentation. It is important to leave ample time for questions.

Responses to questions are most important. If the response merely provides clarification of the contract documents, there is no need for inclusion in an addendum. **However, if the question**

clearly requires modification or expansion of the information provided in the documents, the response must be included in an addendum. All plan holders not just those in attendance will receive the addendum. Obviously, questions, which cannot be answered at the Pre-Bid Conference, should be responded to in an addendum. Responses that will be addressed by addendum should be clearly recorded. An appointed recorder should provide concise yet comprehensive minutes.

Section 2.0 Award Procedures

2.1 BID AND PRE-AWARD PROCESSING

The normal sequence of activities used by the City in award processing is as follows.

1. Bid closes
2. Bid Tab is generated by Purchasing Agent
3. Bid Tab is sent to Project Manager
4. Review by PM
5. Letter sent by PM; award is recommended
6. EEO approval requested and returned to Purchasing
7. Contract documents are prepared/typed; Board of Control recommendation is sent to City Manager
8. Contract documents are sent to Reproduction for copies
9. Board of Control recommendation is returned to Purchasing
10. Contract is sent to Finance for certification
11. Contract returned to Purchasing, including bond and insurance.
12. Contract sent to Contractor
13. Signed contract returned to Purchasing
14. Contract sent to Law Department
15. Contract returned to Purchasing
16. Contract sent to Purchasing Agent for final signature
17. Contract executed; copy sent to Contractor and Project Manager
18. PM sends a copy to DOT&E accounting section. 19. CE gets a copy of the executed contract from Accounting

Emergency Bids

1. Purchasing reviews bids and bid documents
2. Purchasing agent sends notice of award to Contract Compliance, note per Purchasing Policy No.24 no EEO preapproval is required to award the contract.
3. Purchasing gets the funds certified.
4. Once Purchasing receives confirmation from Contract Compliance, contract is sent to Board of Controls
5. Contract returned to Purchasing and sent to contractor
6. Contractor returns the contract along with Bond and Insurance. At this point a NTP can be sent to the contractor. For an emergency where imminent danger exists as soon as the Purchasing agent receives Bond and Insurance from the contractor, work can proceed before steps 2 through 6 are complete.
7. Contract is sent to Law
8. Contract is sent to Purchasing Agent for final signature.
9. Contract is fully executed.

On the day of bid opening there should be clear understanding of the process. Bidders may have the bids returned to them upon written request anytime prior to the designated time for bid opening. Once the designated time has passed bids will not be returned. Under no circumstances are bids received after the designated time for opening. A clock showing the correct time should be clearly visible and tables provided to allow an orderly processing of the opening of bids. The City's PM and a representative from the city's Finance Department should be present. The city's Purchasing Agent will read out the bid amounts, any alternate bids, and any substitutions, another member of the purchasing department will record the amounts read.

Bid tabulation sheets should be prepared by the purchasing agent and forwarded the PM. Typically the bid tabulation sheet will show the title of the contract or contracts to be opened,

space for names of bidders, columns for noting receipt of bid bond and acknowledgment of receipt of addenda, a column for base bid and columns for each bid alternate.

At the time of bid opening the purchasing agent should announce that time for receipt of bids has passed and no further bids will be received. The purchasing agent will then declare that this is the time and place for opening of bids for designated contract(s), welcome all attendees, make any required formal announcements and proceed to opening of bids.

The purchasing agent will take the opened bid, read out the name of the bidder, declare that bid bond is included and receipt of addenda acknowledged and then clearly read out the base bid amount, followed by the amount(s) of any alternate(s) and/or substitutions. These amounts should be entered on to the bid tabulation sheet. Discussions about the acceptability of the bids as they are read should be avoided.

At the close of the bid opening all bids should be collected and held at a secure location. Upon request bid bonds should be returned to any bidder who is not in contention for an award. All bids are considered good for a reasonable amount of time (usually considered to be ninety days or until an award is made and the contract is executed. Bidders who due to excess pricing are clearly not in contention may request and receive their bid bonds upon request, however the City is not required to comply.

The CE shall assist the Design Engineer (DE) in reviewing bid prices and compliance with other requirements of the bid documents.

Bid Evaluation sheets should be prepared. If it is a lump sum contract without alternates, there is usually little to evaluate other than conformance with the Instructions to Bidders. The bids should be compared to the Construction Estimate. The range of bids should be reviewed regarding where the estimate came in relation to all bids, the gap between first and second bids, and all bids. If the bid is over 10% the engineers estimate, the PM must supply a written explanation of why the bid should be awarded along with an explanation of additional funding required per administrative regulation 27. An award should be made within 90 days from bid closing date. If the 90-day period expires the award should only be made if the bidder is agreeable.

If all or most bids are substantially above or below the estimate, the estimate should be carefully checked to see if the disparity can be determined. If there is a large gap between the low and other bids, and the other bids are within the region of the estimate, the low bid should be carefully examined.

If the contract is a unit price contract the Bid Evaluation form should list all the bid items and quantities down the side and the bidders along the top so that each unit price can be compared. Evaluation of unit price bids require more care and a good understanding of the project and bidding strategies. A bidder will try to determine if quantities for any item are likely to increase or decrease in the construction of the work. The bidder will likely reduce his unit price for an item expected to decrease and increase the unit price on an item that will over-run the bid quantity.

It is possible in this review process to detect potential strategies. For instance, if there is an item for sheet piling and the bidder shows only one cent per square foot, it is possible that the intent is to not use sheet piling and to achieve the effect some other way, i.e., open-cut. On the other hand the bidder may have elected to put the money in another item for reasons known only to the bidder.

On open competitive bidding, there is little one can do about unusual pricing in the unit price bid. If one can demonstrate that the pricing will create front-end loading so that the Contractor will be paid more than the real value of the work in the early stages of the contract, the bid could be rejected. However, this could lead to litigation and delay to the project.

Add or deduct alternates shall be carefully evaluated since acceptance or rejection may affect who the low bidder is. Substitutions offered by the contractors shall be carefully evaluated since acceptance may also alter the low bidder. The recommendation of award letter shall address acceptance and rejection of substitutions with sound technical reasoning.

2.2 PREPARE SERVICE ESTIMATE AND OBTAIN FUNDING

After reviewing the bid tab the CE should prepare a Service Estimate to be submitted to the PM. The CE and PM must determine what level of construction engineering and inspection services and support services such as surveying and materials testing are required for the project. The scope of services and the schedule should be developed. The funds needed to obtain these services should be estimated and coordinated with the Project Manager. Adjustments in the scope of services may be required if available funds are not adequate any reduction in the scope of service should be in writing and agreed to by the PM. The CE should request the PM to obtain appropriate certification of funds if outside agencies are responsible for service funds. The CE should also obtain from the PM a Job Order Number for personnel costs and request that funds be certified to the testing agent's contract.

2.3 EXECUTION OF CONTRACT DOCUMENTS

Prior to award of contract, a Pre-Award Conference may be held with the successful low bidder. Attendees should include at minimum the contractor, purchasing agent, contract compliance, CE and PM. This conference will provide an opportunity to question the low bidder on the degree of understanding of the project and contract documents. If there are unit prices that are particularly high or low in relation to industry prices or other bids, the Contractor can be asked to justify these. The Contractor can be asked if there were any particular concerns that caused an inflation of some or all of the bid prices and discussion may indicate an unwarranted area of concern.

The Pre-Award Conference will provide an opportunity to review the project and the requirements of the contract and determine if there are any discrepancies, mistakes or misunderstandings that could seriously jeopardize the successful completion of the contract. The Pre-Award Conference should provide a degree of confidence in all parties in proceeding to award of contract, if this is not achieved the award should not be recommended.

The conditions precedent to the award of contract are usually defined in the contract documents. The Contract is prepared by the City and transmitted to the Contractor for signature. In returning the signed contract, the Contractor is usually required to attach other documents. These will usually include Performance and Payment Bonds and evidence of valid current insurance. The contract documents shall be thoroughly checked for conformance to the contract requirements.

The City Purchasing Agent may withdraw contract awards anytime prior to final execution of the contract.

Commencement of the work is not usually permitted prior to execution of contract and the City is not responsible for any resources committed to the project by the contractor prior to execution of the contract. However, the contract documents may stipulate limited commencement of work by Notice of Award, official Notice of Award occurs when the Purchasing Division sends the contractor a written notification with the actual contract document. This would normally be followed by Notice to Proceed. Generally, the Notice to Proceed signifies the commencement of the contract time. The CE and his staff should be aware of the procedures for commencement of work and be fully set up on site ready to administer the contract from its inception.

2.4 PRE-CONSTRUCTION CONFERENCE

The CE should schedule and chair a Pre-Construction Conference and invite City representatives including, the City Engineer, the Principal Construction Engineer, the Contract Compliance Officer, the Purchasing Agent, the Designer-of-Record, Public Utilities and government agencies including MSD, Traffic Engineering, and HMD, the Contractor and assigned subcontractors. The CE should complete checklist of attendees to be notified. The purpose of the meeting is to

introduce all the participants in the project and to discuss actions necessary to the successful start, prosecution, and completion of the contract. Items to be discussed should be listed on a prepared agenda issued to the participants. Agenda items should include the following:

- a. Introductions - City personnel, Design team, Contractor's personnel
- b. Submittals - Shop Drawings, Working Drawings, Samples
- c. Mobilization - Site Access, Contractor's Area, Field Offices
- d. Compliance with laws, codes and regulations - Permits, Environmental concerns, Erosion Control, Disposal of Construction Debris and Excavated Materials
- e. Quality - Contractor's QC Plan and Procedures, Inspection, Testing, Non-Conformance Notices (NCN), Off-site Inspection, Testing and Documentation
- f. Survey and Layout
- g. Schedule - Preliminary, Final, Updates and Revisions, Coordination with other Contracts, Construction Methods
- h. Status of Right of Way
- i. Utilities Conflicts
- j. Status of Contract, Notice to Proceed Date
- k. Meetings - Progress, Schedule, Coordination, Safety
- l. Document Control - Drawings, Requests for Information (RFI), Correspondence, Reports, Progress Photos
- m. Payment - Interim, Final, Stored Materials, Supporting Documents
- n. Changes - Contract modifications, changed conditions, claims, and disputes, Request for Proposals and Proposal Requests
- o. Safety - Contractor's Safety Plan, Insurance, Maintenance and Protection of Traffic, Jobsite Housekeeping, Jobsite Security, Accident Reporting, First Aid and Emergency Services
- p. Labor - EEO/AA, SBE participation, Certified Payrolls, Training
- q. Project Completion - Closeout Procedures and Schedule, Punch Lists, Final Inspection, O&M Manuals, Spares, Training, Warranties and Guarantees, Closeout Documentation, As-Built and Record Drawings, Final Quantities and Final Payment

The Pre-Construction Conference is important for setting the tone for the relationships and to prepare the ground for the efficient administration of the contract. The Contractor should be urged to come prepared for the meetings with a written list of any questions, requests, or suggestions to be addressed at the meeting. Detailed minutes should be recorded and an action list included and attached for subsequent actions agreed at the meeting. The Pre-Construction Conference minutes will constitute an important contract record and appropriate care should be given to their preparation and distribution.

Because of the importance of the Pre-Construction Conference, care should be given to selecting the location. Ill-furnished trailers with no heat or air-conditioning, subject to noise, dust and interruptions are not conducive to efficiency. The venue should be comfortable, quiet, not subject to interruptions and phone calls. There should be adequate seating for all attendees around a table. Looking at, and talking to the backs of people's heads, as in a classroom setting, is not likely to generate team spirit or to promote familiarity between participants.

The CE will chair the meeting. Be sure to allow adequate time to discuss all items on the agenda. Matters requiring subsequent response should be clearly recorded in the meeting minutes with action assigned to a specific person and a date by which response must be made.

2.5 ISSUE NOTICE TO PROCEED AND RELATED DOCUMENTS

The CE shall issue, under the signature of the Principal Construction Engineer, the documents required to start construction, a written Notice to Proceed (NTP), on a timely basis soon after a

contract is executed. The CE cannot authorize work to commence (Notice to Proceed) until the contract is fully executed. If circumstance warrants it the CE may delay the Notice to Proceed at the request of the Project Manager, Contractor, and/or Outside Agencies. To avoid delay claims, if right of way acquisition problems or utility conflicts are found the CE may also delay the NTP, until these are resolved. Any delay in start of work needs to be approved by the PM. The Notice of Proceed is official start date and first day counted towards the completion.

The Purchasing agent will issue a Tax Exempt Certificate. The CE should prepare a Notice of Commencement to be signed by the DOT&E accounting representative and sent to the contractor.

Section 3.0 Construction Start-up

It is generally agreed in construction that an efficient, organized, and planned start-up can go a long way towards ensuring a successful conclusion. An unplanned, poorly organized start-up can lead to initial delays and problems that are very difficult to recover from and can have repercussions throughout the life of a project.

Start-up can be a challenging time for Contractors. Labor and equipment have to be mobilized from other projects, since they are rarely sitting idle waiting for this project to come along. Material purchase orders and subcontractors have to be finalized, permits obtained, statutory requirements fulfilled and schedules produced. A well-organized and prepared CE Staff can provide much assistance and facilitate the efficiency of the startup process. A thorough knowledge of the plans, specifications and contract requirements, status of right of way and utility relocations and familiarity with the site and the surrounding areas, all forms and contract administration procedures prepared and in place will make the field staff a resource to help get the project started on the right foot.

3.1 ORGANIZATION AND MANAGEMENT

Construction Engineering and Inspection services are construction management services provided during the construction phase of a project.

Each construction contract will usually have a CE and inspectors and, if the contract is large enough, a Chief Inspector and an administrative staff. The CE and staff may have responsibility for more than one construction contract, particularly if they are small or if there are several construction contracts on a major project.

A typical service organization for administration of construction contracts will include a Construction Engineer, and Inspector. The size of the staff will vary depending on the size of the construction contract and the number of disciplines involved in inspection.

Chief Inspectors, inspectors, and office technical and clerical personnel will be under the direction of the CE. The CE is responsible for the work of all staff assigned to the project, and will designate specific assignments to each, and will supervise and is held accountable for their performance.

The CE should conduct his relations with the Contractors in a professional, cooperative, and business-like manner. Absolute integrity is required and excessive fraternization with key personnel of the Contractor's staff must be discouraged. **The acceptance of gifts or favors from Contractors by any member of the CE staff is strictly forbidden, regardless of their size or value.**

All formal communications should be made with the authorized representatives of the Prime Contractor, and not with subcontractors or vendors. These representatives should be identified at or before the pre-construction conference.

It is very important to promote harmonious working relationships with utility companies, public agencies, and other governmental authorities whose facilities are affected by the project.

3.2 FIELD OFFICES AND FACILITIES

Ideally, the planning for mobilizing and establishing field offices should have been done during the design and bid phases of this project. The site should be reviewed for potential areas for site offices, workshops and storage taking into account access, impact on local residences and businesses, effect on permanent work and cost of Contractor having to provide facilities off site. Where areas are available, this should be made known to bidders in the bid documents including

details on provision of temporary services such as power, water sewer, parking, etc. Where areas are not available on the site, it may be more economical for the City to make off-site facilities available to the Contractor. This should all be part of the pre-bid planning.

The Field Office should be of sufficient size to accommodate the maximum predicted level of staffing. The accommodation and furnishings should reflect the level and professionalism of the services to be provided from the Field Office. The CI is to maintain a clean, efficient, professional environment and the CE should be insistent that the Field Office be maintained adequately. The Field Office should be separate from the Contractor's offices and should be secure and should be equipped per contract specifications. The CE should include his recommendation for field office and equipment in the constructability review.

Where an area is provided for Contractor's use, this should be clearly indicated in the construction documents. Where the area is to be shared with other Contractors, the space for each Contractor should be indicated. The Contractor should be required to submit a plan of the office/yard layout prior to mobilization. The plan should be reviewed with regard to provision of services, handling of oil, gas and other potential hazardous materials, access for supplies and for emergency vehicles, impact on local residents and businesses and demobilization, including dealing with contaminants from workshops and storage areas.

The Contractor should schedule early installation of utilities with the utility companies. This process should be regularly checked and expedited. Field offices can be operated with temporary power sources and this should be planned where provision of power is likely to take some time. Where it is possible to do so, early planning should involve the utility companies so that they are aware of upcoming requirements and can have plans in place when services are ordered.

Temporary facilities should be covered in the pre-construction planning. Access to the site should be reviewed with regard to labor commuting, delivery of materials and movement of major construction and permanent equipment. Routes should be planned to avoid residential areas, school zones, hospitals, and similar sensitive areas wherever possible. Routes should be investigated for low bridges, weight restrictions, overhead utilities, and condition of roads. Where reasonable and possible, the contract conditions should restrict the Contractor's access to designated routes. Where private roads or parking areas abut the construction site, the Contractor must be instructed not to use these without written authorization of the owners, copies of which must be furnished to the CE.

Adequate provision for parking of workers' vehicles should be provided. Workers should not be permitted to park anywhere on the construction site. The Contractor should be required to submit plans for handling of employee vehicles and to control their access to the site. This is necessary for safety, security, and operational reasons.

The site security requirements will usually be specified in the construction contract and the CE should be familiar with the requirements. Where the documents are not specific, there are certain basic requirements that safety, prudence, and common sense dictate. Any site security plan should cover prohibition of access to the public to areas of hazard or danger, security of storage of materials and equipment, security of offices and files and vandalism.

3.3 PROJECT AND INSPECTION FILES

The CE must guide others on his staff in the establishing the project files. A standard filing system is shown in Appendix 2. The CE and staff should utilize those portions of Appendix 2 that are applicable to the project they are starting. Field files should be stored in fireproof, locked filing cabinets. All members of the staff should be aware of the extreme importance of creating and maintaining comprehensive contract files. The City's ability to defend against contractor claims is dependent upon the detailed information contained in the contract files. Similarly, contract closeout can be accomplished efficiently if the contract files have been properly

maintained. Since City projects are subject to audits, the administrative records of contracts must provide clear evidence that the contract has been performed in accordance with contract documents.

The CE should provide an orientation on files for members of the staff and provide them documents such as the designer's quantity take-offs that are necessary to start the project.

3.4 DRAWINGS AND SPECIFICATIONS

The CE shall obtain from the Design Engineer and provide to the CHI/CI all applicable specifications and drawings referenced in the contract, including all standards referenced and addendums. In the course of construction the contractor will question many details of the plans and technical specifications. The field staff must be knowledgeable about the drawings and the specifications. Although it is often necessary to refer Requests for Information from the Contractor to the designer, a well-informed CE staff can resolve many issues in the field quickly. The CI should be responsible for insuring that inspectors are familiar with the requirements in the contract. The CI should also play a lead role in meetings with the Contractor regarding Quality Control measures to be employed as new construction activities are started.

The CE must insure that appropriate quantities of drawings and specifications are distributed to the CI and field staff, the Contractor and testing agencies. Care must be taken to insure that all recipients of contract documents use revised documents. When drawings are revised as part of contract modifications, plan sets must be updated with the changed drawings.

3.5 TESTING SERVICES

The CE should verify that the PM has certified money for the preferred testing agent and shall notify the testing agent of the scheduled start of work. The quality of construction is highly dependent upon the effectiveness of the materials testing program. The CE and staff must coordinate testing requirements with the Contractor and the testing agencies. The Contractor must provide reliable schedule information about when specific types of construction activities are to be performed. The appropriate testing equipment and staff must be available for earthwork, concrete placement, asphalt production and lay-down and other specialties as the work occurs.

Requirements for any off-site inspection must be established. Off-site concrete batch plants, concrete trucks, asphalt plants, precast concrete plants, steel fabrication facilities and specialty mechanical/electrical equipment manufacturing plants often require visits by testing agencies.

The CE must insure that test data records are maintained in the project files and the CI should log all testing activities on the IDR. A Notice of Nonconformance shall be issued for any materials, which fail test, and they should be replaced, reworked, or otherwise corrected to the satisfaction of the Project Manager.

3.6 PERMITS

The CE should review the specifications with the DE and PM and produce a checklist of all permits known to be required and who is responsible to get it. This list should be presented and discussed with the contractor at the preconstruction meeting. This list does not relieve contractor of his responsibility to obtain all the permits required. Failure to obtain permits on a timely basis can delay the start of construction and can prompt claims for delay costs. Depending upon the nature of the contract the following permits may be required: Building Permit, Land Disturbance, Demolition, Erosion and Sediment Control, Cut and Fill, Tree Removal, Haul Routes, Traffic Control, Off-site Grading Plans, Noise, Plumbing/Mechanical/Electrical, Sewer Connection, Elevator/Escalator, Automatic Sprinkler and Certificate of Occupancy.

3.7 PUBLIC RELATIONS

Public relations is a major factor in public works projects. The CE must be active in public information and involvement programs, handling complaints and providing the interface between residents, businesses, other city agencies, and the construction forces.

The CE should be familiar with contract requirements relating to public relations and be prepared to cooperate with official programs and to monitor Contractor compliance with PR requirements.

The impact of the project on the local community must be recognized and all reasonable steps taken to mitigate or avoid potential nuisance, disruption, noise, and irritants. The CE should notify affected property owners of the contract scope, schedule and start date of construction. On some projects it may be necessary for the CE to provide updates to residents and businesses at some specific intervals or when items such as parking restrictions and driveway access are significantly altered. The CE should carefully review the drawings and specifications during the constructability reviews for loss of driveway access to multi-tenant buildings and businesses and includes in the contract documents means for temporary driveways and accesses.

The Contractor is required to notify the property owner in advance of the loss of driveway access. The CE should review the contractor's notification procedures and insure that they comply with their contractual requirements.

The Contractor should be instructed to notify the CE of complaints received from the public and incidents or disputes that arise from construction operations. These should be communicated to appropriate City agencies. Consideration for the welfare of the local community will help to prevent incidents and disputes that can affect the progress and/or cost of the work. Where the local community can see that their comfort, safety and convenience are important and given due consideration, they will be far more cooperative. The CE, in the absence of any specific PR requirements or prohibitions, should consider public relations an essential element of his duties.

3.8 SUBCONTRACTORS

The construction contract will usually stipulate certain requirements relating to subcontracting. This may involve qualification and approval of subcontractors, percentage of work that may be performed by subcontractors, payments to subcontractors. The Contractor should be urged to submit his subcontracting plan early and approval of early-action subcontractors should be expedited. Prior to any subcontractor starting work, the prime contractor shall submit a City Subcontractor Approval Request Form (Form 208).

Subcontractors are an essential element in the construction process and should always be treated with respect for their dignity and their contribution to the project. To the extent possible and permitted by the Prime Contractor, they should be involved in planning and scheduling meetings, problem resolution, implementation of changes and any other areas where their expertise and resources can benefit the project. With the Prime Contractor's permission, they can be copied direct with information such as minutes of meetings, correspondence, notification of potential changes, resolution of design or field problems. Where the CE can promote the enthusiastic involvement and cooperation of the subcontractors, with the Prime Contractor's affirmation and support, while maintaining a contractual "arms-length" relationship with subcontractors, this will be of substantial benefit to the project.

It is critically important that the Contractor be aware of, and involved in, any discussions, correspondence or other interaction by the CE with subcontractors. The Contractor should never have the impression, real or imagined, that the CE and a subcontractor are keeping the Contractor out of some matter. Provided that this is done, the Contractor will have more confidence in involving subcontractors in discussions, meetings, and negotiations that involve subcontractors and their work.

Since subcontractors are contracted only to the General Contractor and have no privity of contract with the City, all official communications with subcontractors must always be through the Prime Contractor. The CE must at all times avoid contractual involvement with the subcontractor and must beware of being drawn into any negotiations, disputes, or differences between the Prime Contractor and subcontractor.

Nevertheless, subcontractors will constitute a substantial part of the resources required to deliver the project and balancing the interface and relationships with and between, the CE Field Staff, the Contractor and the subcontractors will require considerable tact, ingenuity, forethought and caution. The object is to promote cohesive, cooperating, mutually respectful, and beneficial team relationships between all the site participants without entering into, or being perceived to be entering into, the Contractor's responsibility for managing the work.

3.9 EEO/AFFIRMATIVE ACTION & SMALL BUSINESS ENTERPRISE SUBCONTRACTING

City contracts require compliance with non-discrimination and minority participation legislation. The contract documents require regular reporting and auditing procedures. The requirements will usually cover affirmative action to achieve stipulated levels of employment for minorities in various trades, confirmation that non-discriminatory policies are employed at the job site, payment of minimum wage rates and subcontracting of stipulated percentages of the work to Small Business Enterprises.

All EEO and Small Business Enterprise (SBE) subcontracting is to be monitored by the City's Contract Compliance office. Contract Compliance representatives must be invited to all pre-construction meetings. All forms related to EEO and SBE utilization must be submitted to Contract Compliance. The Contractor shall copy the CE on all certified payrolls submitted.

Section 4.0 Communications Control

On a complex undertaking such as a construction project where there are many participants' control of the communications will contribute to clarity of understanding, reduction of misunderstandings and enhancement of open, frank, and constructive communications.

Communications may be verbal in one-on-one discussions and phone calls or in meetings between individuals and groups. They may be in written form in correspondence, memorandums, reports, studies, meeting minutes and telephone conversation memorandums. Communications may be visual in the form of photographs, films, videotapes, or videodiscs. It is extremely important, for relational, commercial, contractual and legal reasons, that there be clearly defined systems for control of communications and that an adequate documentation system is established to record the communications.

Verbal communications are the most common form and are the most difficult to capture on permanent records and create the greatest opportunity for misunderstanding. It is important in verbal communications to ask frequent questions to be sure one is being understood. It is also very important to listen carefully and to ask questions if the communication is not clear. Occasional use of a tape recorder at meetings can be useful but constant use of a tape recorder will undermine trust and rapidly inhibit communications.

It is frequently necessary to document conversations for the official record and to disseminate the information to a wider audience. If care is taken to maintain clarity and understanding in verbal communications, it should be relatively easy to reduce the conversation to its salient points and matters and commit these to paper, either in diary form, correspondence, meeting minutes or reports. The CE should give careful consideration to the recording of verbal communications in order to complete the permanent records of the administration of the contract.

Honesty and integrity is absolutely essential if one is to maintain trust in verbal communications. The document record of communications should be a concise, clear statement of what was said and positions expressed. There should be no attempt to embellish the conversation or to draw unwarranted conclusions. If the recorder has not understood what was being communicated, corrections should be made or, in the case of disagreements, the positions of the different parties to the disagreement.

4.1 CORRESPONDENCE

A large part of the documentary record of the communications on a project will be in the form of correspondence, letters between various participants that inform, instruct, advise, or question. The handling of correspondence requires great care. The CE is the focal point for all correspondence and is responsible for ensuring that all incoming correspondence is read, prioritized, distributed, acted upon, and filed as necessary.

*Correspondence where appropriate shall be assigned an ID # and logged.

*All outgoing correspondence shall go out under the CE's signature.

*The PM shall be copied on all correspondence; other copies shall be distributed as necessary.

*Outgoing correspondence must be addressed to the proper individual, generally the responsible senior person.

*Outgoing correspondence should be numbered when appropriate, indicate subject matter, and distributed.

The CE is responsible for maintaining the document record of the construction of the project including all correspondence. Maintenance of this record requires an efficient filing system. A Standard Index is included in Appendix 2 of this manual. Files are to be kept secure at all times and shall be stored in lockable fireproof cabinets.

Important telephone conversations always take place on the project. It is important that important calls be recorded and summarized on a Telephone Conversation Report Form. A copy should be mailed to the other party in order to have validity.

Any changes to the contract amount or completion date can only be done through a change order city form 11AS (see Appendix 4 for instructions).

4.2 DAILY/MONTHLY REPORTS

a) Daily Reports

It is mandatory for the Inspectors to fill out Daily Reports, one for each contract they are working on. These are on standard Inspector Daily Report (IDR) forms. The IDR will constitute the official daily diary of the project. It will provide the most comprehensive record of the installation of the work of the project, the weather, and other conditions affecting the work. The IDR must adequately describe the day, date and contract day number, (determined usually by the Notice to Proceed, i.e., Day #1 is the first day after date of Notice to Proceed) weather conditions and temperatures, personnel and equipment on site, work performed, instructions given or received, problems encountered, delays and disruptions, materials received, quantities of work installed, visitors to the site and other relevant information. As one of the principal forms of documentation on the project, great care should be taken to be thorough and accurate when completing the IDR. The IDR should not be viewed as an exception report, detailing only the negatives, but rather as a definitive report that accounts for all construction work and practices observed by each inspector, whether or not in compliance with the contract documents. It is permissible to commend good work and extra efforts as well as record deficiencies. It is recommended that the IDR be made out using fine-point ink pens, not pencil that can fade and smudge over time. IDR shall be filled out on the City standard form per the instructions attached.

b) Monthly Report

A Monthly Report should be done for each contract. It may take the form of the standard Monthly Report form in appendix 1. The Monthly Report is normally completed by the CE or OE. Major events, milestones, starts and completions of large activities, visitors, changes and claims should be described on the Monthly Report, together with summaries of work complete and time expired, where required.

The Monthly Report should contain observations on concerns and potential problems with some indication of possible effects and remedies. The Monthly Report should also record positive elements and commendations for Contractor's employees who have demonstrated a high regard for quality, safety, and team building, and for other parties, such as utility/agency representatives who positively impact the project. Where possible, photographs of the project should be included demonstrating work complete that month.

The CE should keep in mind that the Monthly Report may have wide circulation, and attention must be given to its preparation. Together with the IDRs, the Monthly Report provides the detailed job history and will have great importance in the event of claims or disputes leading to litigation.

4.3 MEETINGS

For coordination and information purposes, there will be a need for getting people together for meetings. The CE can expect, and should not hesitate to call for, various meetings with various people at various times and at various locations. Often, the only way to get progress on some issues is to get the people involved to sit down together and agree on how to go forward or to resolve some issue. Meetings should not be called unless really necessary and should be as brief as the business allows. The CE should chair the meetings whenever possible and keep the meeting focused and on track.

All meetings should generate minutes to describe the business of the meeting, decisions agreed, action items to follow, to identify attendees and to indicate distribution of the minutes. Brief, intelligible, and accurate minutes are important and should be given sufficient attention and care. If meetings are in the field or time is critical, it is permissible to distribute handwritten notes, provided they are legible.

Meetings should also generate Action Item Lists. These may be part of the minutes or a separate document. Actions to be taken following the meeting should be clearly described so all parties understand what the action is, should have a specific name assigned to carry out or otherwise be responsible for the action, and a date by when the action will be completed.

a) **Progress Meetings**

The CE should establish the frequency of progress meetings in coordination with the Contractor. In general, bi-weekly progress meetings are preferred and shall be adopted unless otherwise directed. Where meetings are held at regularly scheduled intervals, the use of a standard agenda makes sense. The CE shall see that the minutes are accurately kept, distributed, and filed. The PM shall be copied on all project-meeting minutes. The recommended agenda for progress meetings is as follows:

1. Minutes of Previous Meeting
2. Progress. Construction activities last period (week, two-weeks)
3. Related Business. Problems encountered
4. Schedule for next period (week, two-weeks)
5. Submittals - Other Information or Approval Requirements
6. Safety
7. Quality Issues
8. Changes, Claims, Delays
9. Any Other Business

Depending on the project, other subjects can be added but all of the above should be addressed. If there is nothing to report or discuss on a particular subject, the minutes should so note to indicate that the subject was raised.

Progress meetings are important for coordination and management of the project but also for the record of progress they generate. It should always be kept in mind that progress meetings are intended to review and record progress for the past period and to review the planned schedule for the upcoming period. This apparent statement of the obvious is sometimes lost in the other subjects covered at the meetings.

It cannot be overemphasized that progress-meeting minutes constitute one of the most important elements of the contract document record and should receive the requisite care and attention. They are important to the management and coordination of the work through the distribution of information to all parties, on and off the project site. They are important for educating new participants on the projects and they are often critical in the resolution of claims or disputes.

4.4 AGENCY/UTILITY COORDINATION MEETINGS

Most projects will involve the participation of public utilities, i.e., water, sewer, gas, electric, cable TV, petroleum products, and statutory agencies such as State, County, and City Governmental Agencies. Coordination with these utilities/agencies is an important element in the work of the CE and can be critical to the success of the project. It may be necessary to hold separate Utility/Agency Coordination Meetings from time to time.

Depending on the extent of utility/agency involvement in the construction, these meetings may be regular or ad hoc. Utility/agency representatives should be encouraged to attend Progress

Meetings and where their work or involvement is crucial to schedule and progress. There may also be a need for additional separate meetings with the utilities/agencies for investigation, for planning strategies, for financial considerations, etc. These may be formal meetings in the office or informal meetings in the field. In any event, notes of the meetings must be taken and distributed to all who need to know.

4.5 PHOTOGRAPHIC RECORDS

The Construction Contract will often indicate specific requirements for progress and record photos of the work. The Contractor may be given the responsibility for progress photos or the City may contract with a professional photography service. The CE should pay particular attention to the project requirements and ensure that they are fully met.

Section 5.0 Drawing Control

The Contract Drawings and Specifications represent the graphical and textual information indicating the work to be constructed. It is essential that this graphical and textual information be carefully controlled and distributed so that all contributors to the construction can be assured that they are working to the latest and most accurate information and that there exists a formal procedure for clarifying, expanding or amending that information.

5.1 CONTRACT DRAWING DISTRIBUTION AND REVISIONS

The CE will ensure that the field office receives sufficient copies of the contract drawings and specifications, including all addenda issued prior to contract. The CE shall deliver to the Contractor the number of copies of plans and specifications stipulated in the construction contract, together with all addenda. Copies of plans and specifications may be required by other entities such as governmental agencies, public utilities, railroads, other inspection agencies, and other Contractors interfacing with the work of contract. The CE shall ensure that plans and specifications are sent to the correct parties as requested. Whenever revisions to plans and specifications are issued, the CE shall issue a Proposal Request to the contractor to incorporate into the contract.

5.2 SHOP DRAWINGS, WORKING DRAWINGS, SAMPLE SUBMITTALS

Shop drawings are provided by the Contractor to expand, verify, or complete the information provided by the Designer on the plans or in the specifications. These may include catalog cuts, manufacturer's standard drawings and details, fabricators' detailing, equipment performance characteristics, etc.

Working drawings are provided by the Contractor to indicate means and methods of construction and design and description of temporary works including, sheeting, shoring, underpinning, cofferdams, temporary construction loads, etc.

Samples are provided by the Contractor to indicate conformance with descriptions of finishes or to provide a selection for final choice by the Designer.

The contract documents will indicate the shop and working drawing and sample submittals required of the Contractor. Where submittals are normally required but are not indicated in the contract documents, this should be clarified with the Designer to determine if submittals are, in fact, required. If so, this information should be provided to the Contractor.

The CE should request from the Designer a list of all required submittals. The CE should review this list with the contract documents and prepare a final list of all contract-required submittals. This submittal list should be forwarded to the Contractor for review and confirmation that the list is fully inclusive of all required submittals. The Contractor should be instructed to include the list of submittals in the construction schedule and to return the submittals list with each submittal numbered consecutively in the order of priority determined by the schedule.

The CE shall maintain a Submittal Log indicating each submittal's unique identification number, title, date of receipt from Contractor, date forwarded to reviewer, date received back from reviewer, status (i.e., approved, approved as noted, revise and re-submit, or rejected) and date returned to Contractor. Where there is more than one reviewer, additional columns should indicate date sent to and received from each reviewer. Re-submittals shall have the original identification number with the suffix "A", "B" or "C" indicating each re-submittal. The CE shall maintain the Submittal Log so as to provide a clear history of the processing of each submittal.

The CE or designer shall review each submittal to confirm that the submittal is in accordance with contract requirements. If not, the submittal shall be returned to the Contractor with a letter of

transmittal indicating the deficiencies in the submittal. If the submittal is satisfactory, it is to be forwarded to the reviewer (usually the designer) as quickly as possible. The reviewer shall stamp the submittal, "Reviewed, No Resubmittal Required", "Reviewed Exceptions Noted, No Resubmittal Required", "Reviewed Exceptions Noted, Resubmittal Required", or "Rejected, Resubmittal Required". It is the responsibility of the CE to track and expedite the review process of all submittals and to provide notification to relevant parties when the review process is exceeding, or is likely to exceed, the scheduled or stipulated or reasonable review period. Submittal progress should always be an agenda item at Progress Meetings and all parties kept informed.

The CE shall track all submittals returned to the Contractor and shall note the reviewer's comments and action required.

The CE shall maintain copies of the approved submittals and keep a clean copy in the field office for record and audit purposes. The CE staff must ensure that work is not performed without approved shop or working drawings or samples. On completion of the work, a copy of all submittals shall be included in the Contract records.

5.3 REQUESTS FOR INFORMATION/CLARIFICATION

From time to time the Contractor may request information in addition to the information provided in the contract documents or for clarification of information provided. These Contractor requests must be logged and documented. Prior to the commencement of construction, the CE should provide to the Contractor a supply of Request for Information (RFI) forms. The Contractor should be instructed to use these RFI forms for all information or clarification requests, numbering each request consecutively. For projects with multiple contracts, the RFI number should be pre-fixed with the contract number.

The Contractor should be instructed to use the RFI forms only for information or clarification purposes. They should not be used to request changes to the work or to offer savings through different materials, processes, or procedures. A request for information or clarification may result in a change, which will then be dealt with by a Request for Proposal submitted by the contractor or a Proposal Request issued by the CE. On receipt of a RFI, the CE shall review to determine who is to respond.

The CE will track and expedite the RFI to ensure a timely response. The CE will forward the response to the Contractor together with any further instructions generated by the response. For instance, the RFI may indicate a need to change the design or contract requirements, which will, in turn, generate a Proposal Request.

The CE shall maintain a RFI Log which will list the RFI numerically, describe the nature of the RFI, indicate date of receipt, dates to and from the A/E, date response returned to Contractor and any changes or other instructions generated by the RFI. The RFI Log should be reviewed at Progress Meetings to ensure that processing of RFIs does not impede the progress of the work.

5.4 PROJECT RECORD DOCUMENTS

It is an exceptional project that does not experience minor field changes. These minor field changes will not warrant the formal issue of revisions to drawings or specifications but do need to be officially recorded for operations and maintenance purposes and for possible future expansion or renovation of the facility. The CE shall record and submit to the Designer all as built information. The Designer is responsible to incorporate this as built information in a permanent, final completed set of drawings.

Section 6.0 Schedule Control

The successful delivery of a construction project will depend, to a large degree, on the quality of the planning provided at the beginning of the project and the diligent monitoring of the construction plan during construction.

6.1 CONSTRUCTION CONTRACT SCHEDULE

There must be adequate time allowed for the Contractor to prepare a realistic schedule. At the same time, it is important to know as soon as possible those activities that will occur early so that the CE can plan their supervision. The contractor shall be advised and required to submit a general plan of work sequence from start to finish at the preconstruction meeting. The contractor shall submit a final schedule within two weeks after the notice to proceed. The CE should expedite this review and send a final copy to the project manager.

A second important consideration is for procurement activities, including submittal and approval of shop and working drawings and samples, to be included on the construction schedule. To this end, the early preparation and agreement of the required submittals list is important. The CE should require all procurement activities to be shown on the schedule with supporting information for the procurement durations shown. Particular care should be given to major equipment or material purchases where delays could severely impact the schedule.

The construction schedule activities should be limited to a maximum of 15 working days duration, whether a CPM or bar-line schedule, and should show interrelation with sequential and parallel activities. The schedule must clearly indicate the completion date and any contractual milestone dates. The CE and field staff shall review the schedule to establish that there is a logical sequence of activities, that the durations for activities are sensible and achievable based on the known or reasonably expected resources available, and that the format meets all contractual requirements. The review is not expected to comment on means, methods, techniques or practices except where such are required or prohibited by contract or where they deviate from good and usual construction practices.

The CE and field staff should be willing to meet with the Contractor during the formulation of the construction schedule and indicate areas of concern regarding the logic of the schedule or deviations from contract requirements. It is permissible to offer advice and suggestions on development of the schedule so long as it is clearly understood, and documented in the minutes of any meetings, that the Contractor accepts full and final responsibility for the construction schedule, and that any advice or suggestions offered by the CE field staff are not to be construed as directions or even recommendations to the Contractor in the development of the construction schedule.

It is essential that the construction schedule be developed and completed early and that no delay to submittal and acceptance of the schedule be permitted beyond the contractually mandated periods. The Contractor should be advised that payment can be withheld for work installed after the date that the construction schedule should have been received and accepted, until such acceptance has been achieved. The CE should give full attention to this matter since the establishment of a sensible, achievable schedule is critical to the installation of the work and the avoidance of delay claims.

6.2 SHORT-TERM SCHEDULES

Although the construction schedule is the master plan for the completion of the work, the day-to-day installation of the work by the Contractor's field foremen and superintendents is usually managed by means of short-term schedules extracted from the overall construction schedule. These short-term schedules normally cover periods from one to four weeks, with two-week look-ahead schedules being usual.

If the construction contract is not explicit on the requirement for look-ahead schedules, it can usually be interpreted as implicit and every effort should be made to require that the Contractor submit short-term schedules. Since these short-term schedules are normally the Contractor's primary guide to day-to-day construction activities, it is important that the CE field staff have these schedules for monitoring of the work.

The CE should insist upon short-term schedules containing specific, measurable activities. The Contractor may resist specificity in order to avoid being held accountable. Vagueness may be preferred to avoid being called to account for failure to achieve. A requirement for specificity demands that careful thought be given to planning the two-week schedule. Review of the proposed short-term schedule at the Progress Meetings will determine if the resources are sufficient and available to meet the schedule. This will include Contractor resources and support resources such as CE supervision, information, and approvals.

Attention given to the detail of short-term schedules will greatly increase the planning of the work and the efficiency of its installation. This will be to the benefit of all parties, not least the Contractor. This will usually lead to increased willingness to participate by the Contractor and enhancement of the team approach to the work, which in turn will lead to greater likelihood of successful completion. To achieve this cohesion will usually require considerable effort on the part of the CE in the early stages of the contract and regular reinforcement throughout.

Regular submission of the short-term schedules and the regular marking up of the schedules with the actual achievement will provide a detailed history of the planned versus actual installation of the work. Such a record can be invaluable in the resolution of claims for delay and disruption. These records usually indicate clearly where actual installation differed from planned installation and the reasons therefore. The causes for the delay can usually be clearly discerned as City, Contractor, or third-party responsibility. With this information available, resolution of problems can quickly be agreed.

6.3 SCHEDULE UPDATES AND REVISIONS

The construction schedule is a living document and must be continually assessed against actual events to determine its continuing viability. The CE should advise the Contractor early that contractual schedule updates will be required and reviewed.

The schedule review by the Contractor and the CE field staff should carefully consider the work installed during the period compared to the planned installation. Reasons for differences should be examined and the impact on following work assessed. Where targets were exceeded by small amounts, the logic is best left unchanged and the additional float maintained to cope with possible obstacles in the following period. Similarly, where targets were missed by small margins, the additional work in the following period can probably be absorbed without changing durations.

Where there are trends over two or more periods where targets have been exceeded or unmet, the reasons should be examined to determine if they are short-term and unique or long-term and systemic. If short-term, the loss may be made up with a short burst of additional resources without need to revise the logic for following work. Minor schedule gains or losses can be incorporated into the schedule by shortening or lengthening following activities which increases or decreases float without affecting the logic or completion date of the project.

Major gains or losses of time, major changes to the contract, changes to fundamental means and methods may all require revisions to the contract. The CE staff should be available to the Contractor in the examination and development of changes in logic, sequences, means and methods, resource allocation and other steps to recover, maintain, or accelerate the schedule.

The primary aim is maintenance of the contract completion date without additional cost to either the City or the Contractor. Regardless of fault, delay to the scheduled completion will usually incur additional cost to the City, despite liquidated damages.

Where completion to schedule cannot be maintained without additional costs, the CE should be prepared to examine various strategies. The costs of acceleration to meet the contract completion date should be compared with the costs of delay including the costs to the Contractor and to the City.

Schedule updates and schedule revisions are to be maintained on file together with documented review comments and recommendations. The Contractor should be clearly informed that delay in submission of the schedule update may result in a withholding of payment.

6.4 SCHEDULE COMMUNICATIONS AND MEETINGS

Early establishment of the reporting relationships between the Contractor's staff and the CE staff is important for the successful planning of the work. Meetings shall be established for earliest possible development of the preliminary and overall project schedules. The CE staff should be prepared to meet as frequently as necessary with the Contractor's staff to expedite the provision of a Project Schedule.

Regular Schedule Update Meetings shall be established and may be incorporated in to the normal progress meetings. These meetings should be attended by the CE, the Contractor's Superintendent, Contractor's field superintendents and superintendents of major subcontractors and senior CE field staff. When needed other City representatives should be invited as well as representatives from the PM, utilities and government agencies where their input and cooperation is essential to maintaining the schedule. The PM should be a regular attendee except perhaps in the later stages of the project.

The Schedule Update Meetings are intended to be practical, cooperative working sessions to determine the best possible plan for the on-going prosecution of the work. The purpose of the meeting is to determine the most efficient and effective way forward based on the construction knowledge and expertise of all parties present, working in a supportive and cooperative team environment. The CE should give special attention to developing and maintaining this team attitude at the Schedule Update Meetings and to persuading the Contractor to bring the best field expertise to the meetings.

6.5 PROCUREMENT CONTROL

Procurement control is normally the responsibility of the contractor. However, the CE should be aware that untimely procurement of critical items would delay the completion the project. Thus, the CE should exercise some monitoring over critical items. The CE should require the contractor to provide a critical list of materials needed (for example anchor bolts, street pavers, end dams, architectural finishes) and when delivery is scheduled. Where shop drawings and/or samples are required the delivery times should include appropriate review time. The CE should monitor this list, delivery schedule, and the return time for any reviews at each progress meeting.

For City furnished items, (for example traffic controllers) the CE should require the contractor to supply adequate notice of when the items are needed. The CE should verify at the beginning of the project that these items would be available upon request by the contractor. The contractor should submit a receipt of pick up or delivery, which should be filed in the project file.

For items issued by the City's Highway Maintenance storeroom, the CE should fill out the requisition complete with job title and fund number.

SECTION 7.0 Cost Control

The responsibility for controlling and recording the flow of funds for the construction of the work and for managing changes to the work that affect the cost of the project must be achieved by development and maintenance of clear, accurate, sufficient document records that detail the flow of funds and the contractual transactions controlling that flow. The document record must be available for audit at any time during and after the project and must be maintained neatly, current and accessible.

7.1 PROGRESS PAYMENTS

Most contracts stipulate that the work will be paid for at regular intervals, usually monthly, during the course of construction. The contract will stipulate the period for payment; the timing of submission for payment; the required documentation and amount of retainage. The cut off date for quantities needs to be discussed and agreed to with the contractor. The essential requirements are that only acceptable work installed be paid for; that the amount remaining to be paid, including retainage, is sufficient to complete the work in the event of default by or termination of the Contractor; and that contractual requirements necessary for payment are fulfilled. Progress payment applications shall be submitted on City Claim Voucher-Invoice (Form 37) and supported by Affidavit of Original or Sub-Contractor (Labor and Material) (Form PURCH 66) and Affidavit of General or Mechanical Branch Contractor (Form 97S). Before final payment is made the Contractor is required to submit all documentation as specified in the City of City Supplement to ODOT Section 109.08.

7.1.1 METHOD OF PAYMENT

Payment for construction may be by several methods. These include unit price payments, lump sum payments, or a combination of these. The contract documents will stipulate the method of payment.

Lump sum payments are paid upon completion of specific portions of the work. The Contract Lump Sum is usually broken down into several stage payments, the amounts for each stage being as bid or as approved by the City, per approved schedule of values

Unit Price Contracts include a detailed Bill of Quantities, each item of which is priced by the bidder. The total of all the unit prices is the total contract bid. Payment is made against the actual quantities installed and the final total may or may not be the same as the original total bid.

7.1.2 METHOD OF MEASUREMENT

Interim payments on a Lump Sum Contract require a breakdown of the Lump Sum. This Billing Breakdown, usually referred to as a Schedule of Values, should give a detailed list of the components of the work with a cost assigned to each component. Many Lump Sum items can be quantified, foundations for example. The CE should insist that the Schedule of Values sufficiently breaks down the Lump Sum so that estimation of interim payments is largely a mathematical exercise. Progress Payments should not rely on extensive subjective estimates of completion of large sections of the work. It may be a simple matter for a CE and Contractor's Project Manager to look at an element of work and agree that it is 20%, 40%, 60%, or some other percent complete. It is not such a simple matter to maintain an auditable document trail to justify the estimates of completion.

Unit Price Contracts are usually the easiest for preparing Progress Payments. However, they do create an administrative burden with the volume of paperwork required. The first essential with a Unit Price contract is to request from the DE a complete quantity take-off from the bid-drawings to check the Bid Quantities. Any major discrepancies in the actual quantities of work performed and

the DE take-off must be reconciled with DE. Work installed must be measured or calculated on a daily basis recorded on the Inspectors' Daily Report and transposed regularly to the Monthly Pay Book. Price adjustments for reductions or additions of unit priced quantities shall be made per contract specifications and documented by a contingency allocation or change order. Payment for items when they exceed the bid estimated quantity is permissible as long as the final contract amount does not exceed the original certification. A final change order or contingency allocation shall be processed to document these adjustments in quantities. The CE must constantly be aware of trends for quantity overruns of an item. The CE should review monthly data to recognize these trends and take positive action to mitigate or obtain additional funding from the PM.

Many Unit Price contracts include Lump Sum items. These may include General Conditions, Mobilization, Temporary Field Offices, and other items. Where these lump sums are large and extend over several pay periods, the CE should require a breakdown of these lump sums in the same manner as a lump sum contract.

7.2 CONTRACT CONTINGENCY

In any construction contract it is not possible to completely predict all the issues that will arise in the field. During construction, unexpected events, contractors failures, incorrect assumptions, public demands, even design deficiencies will require directives to the contractor and payment for additional or changed work.

In order to preserve the contract schedule a realistic contingency account needs to be established and included in each construction contract. These contingencies will be a lump sum item to be disbursed only by an authorized Contingency Allocation form. By this means the funds will be authorized and available throughout the contract, but only dispensed if and when the needs arise and a contingency allocation is processed. If some or all funds are not expended, they will accrue to the City by final change order, not to the contractor.

All spending towards this contingency must be for work directly relevant to the completion of the contract. Any additional scope changes or work not relevant to the contract must be added by change order.

The CE will have immediate authority to proceed with work billed towards this contingency up to an estimated \$5000.00 for any one individual occurrence. Other expenditures over \$5000.00 must be approved by the Project Manager. If the contingency gets depleted it can be reestablished by nonperformance of contract quantities not used through a contingency allocation or additional money certified to the contract by change order.

Approval chain for Contingency Allocations are; Contractor, Construction Engineer, Principal Construction Engineer, Design Engineer (if the change is design related), Project Manager (Client).

7.3 CHANGE ORDERS

During most construction projects conditions or circumstances may arise that will cause or create a change to the contract. The construction contract documents will stipulate the conditions or circumstances that constitute changed conditions and the procedures to be adopted to amend the contract to incorporate the changed condition.

Assessment of potential changes and the resolution and processing of change requests requires contractual skills, tact, diplomacy, and a thorough knowledge of the site and contract conditions. The CE staff must be knowledgeable of the terms of the contract in regard to changes and move swiftly to institute the procedures as soon as a potential for change becomes apparent.

The CE shall review all notifications of change from the Contractor and shall provide recommendations to the PM. If current work is affected by the situation, the CE staff will monitor

all labor, equipment and materials involved and any delays incurred. In certain circumstances, for safety, for maintenance of schedule or to avoid major costs, it may be necessary for work on the change to proceed prior to agreement on costs and processing of the change order. The CE should obtain approval for work to proceed from the Principal Construction Engineer and follow up with the PM and the processing of a change order the next working day, notify the Contractor and maintain time and material records.

A changed condition may be occasioned to add to, delete or modify the work of the contract. A change may be due to an error, omission, or change in the design, which requires a change in the work. A change may be occasioned by differing site conditions or situations arising that were not contemplated in the contract, could not have been reasonably foreseen by the Contractor, and will cause a change in the work. For a no cost change order due to a change condition the CE can authorize work to proceed immediately with verbal approval from the Principal Construction Engineer and follow up with a change order. When the change requires additional money to be certified to the contract, work should not proceed except for the reasons above until the money is certified through the City system.

The Contractor is required to notify the CE of changed site conditions or situations. The CE and Field Staff should be alert to field conditions to anticipate potential conditions for change. The CE shall notify the Designer of the potential or actual changed conditions or situations that may lead to change orders.

Scope-related changes and design required changes shall be approved by the PM. The CE will issue a Proposal Request to the Contractor requesting the cost and schedule implications of the change. Scope additions cannot be authorized until a Construction Change Order (Form 11AS) is certified. The CE should request a detailed breakout of labor and material costs and avoid lump sum cost responses from the contractor. Each change order must include a justification cover letter and all documentation verifying the amount and method of payment to be made for this work.

If the CE agrees with the Contractor's proposal, the proposal is forwarded for approval. If there is a difference between the CE estimate and the Contractor's proposal, the CE will attempt to negotiate with the Contractor.

It may occur that agreement on costs and/or time cannot be achieved between the CE and the Contractor. In these circumstances the CE shall forward the CE estimate and the Contractor proposal with recommendations. The PM will determine if there is a basis for accepting the Contractor's proposal and shall so advise the CE in writing. Alternatively, the PM can authorize the work be paid for on a time and material basis.

A change order may require an extension of contract time. If there is no time extension granted by change order, the CE should assess liquidated damages if the contractor fails to meet his completion.

7.4 CLAIMS

A claim, in a broad legal context, generally includes making a demand for money or services and alleging a right thereto. A claim is usually referenced as a request by a Contractor or subcontractor for added compensation (money or time) for work performed outside the scope of the contract or for work performed within the scope of the contract but under conditions that were neither bid nor anticipated. Invariably, when a claim evolves, every party involved in the project has played a role in its formation. A contractor or subcontractor should only submit a claim when he believes he will not receive compensation for something to which he believes he is entitled, and has exhausted the available contract remedies.

7.4.1 CLAIMS AVOIDANCE

Claims avoidance procedures should have started early in the design process. Through constructibility and biddability reviews, many errors, omissions, and ambiguities can be identified and corrected prior to bid. The more comprehensive and clear the bid documents are, the fewer the claims likely to be submitted by the Contractor.

The CE's first efforts at claims avoidance is total familiarity, by all of the CE staff, with the plans, specifications, contract language and site conditions. An experienced eye will note areas where the potential for claims exists and contingency plans will be prepared.

The contract records are the second major defense against claims with particular reference to records of planned versus actual installation of the work. A large proportion of claims stems from schedule problems. It is not unusual for a Contractor to fall behind schedule in the early months of a project as the construction forces go through the learning curve and the teaming process. Later the progress will improve and the schedule will be recovered and the end-date achieved. However, the Contractor may often try to blame the initial delays on problems outside of Contractor control and therefore compensable by the City. A detailed record of when work was actually installed in relation to when it was scheduled to be installed and the reasons for the differences, where they exist, will often deter the Contractor from submitting a claim that cannot be sustained in face of the CE's document record. The CE's contract records should be factual and nonbiased.

Various clauses of the contract specifications allow for conditions which enable the Contractor to request additional money or time, provided adequate notification and backup are given. The CE should recognize any situation of potential claim and, where possible, take steps to minimize impacts and ensure complete documentation of before and after conditions.

Whenever possible, visibly changed conditions or other conditions which could result in a claim by the Contractor should be photographed by the CE or staff as evidence for future use.

7.4.2 IDENTIFYING AND CLASSIFYING A CLAIM

Early identification of potential claim scenarios will allow the CE to document and minimize the impacts. The CE should be familiar under separate cover with the Construction Management manual for types and causes of construction claims.

7.4.3 CLAIMS PROCEDURES

At the Pre-Construction Conference, the Contractor should be reminded of the contract conditions regarding the submission and processing of claims. Requirements regarding timely notification shall be clearly addressed and the Contractor advised that no relaxation of the requirements would be permitted. The City of Cincinnati Supplement (section 105.17) states a notice of claim be given within 10 days of commencement of the disputed work. The CE should request this notification be in writing with a detailed description of why the contractor feels they are due additional compensation. The contractor is required to proceed with the work in question even though payment of such work is in question.

As soon as the potential for a claim is apparent, a separate file for that issue shall be opened. Alternatively, upon receipt of a notice to claim from the Contractor, a file for that claim shall be opened. The CE shall acknowledge receipt of notice of intent of claim, in writing, without any commitment or even indication of the CE's opinion regarding the claim, to the Contractor.

The contract language may stipulate the dispute resolution procedures to be adopted on the project. The CE should be familiar with these procedures and be prepared to participate in the various processes. In absence of this procedure any claim received should be reviewed with the

Principal Construction Engineer. The CE shall assemble all documentary and other evidence relating to the claim, including correspondence, photos, reports, drawings, contract language and specifications, and prepare a summary report. This summary report shall be a factual analysis citing specific evidence that will support or refute the Contractor's position. The CE may provide any alternative strategies that will mitigate the cost of the claim, and include his recommendations. The CE should review the claim and recommendation for settlement with the Law Department and asked for comment. The CE should present the claim to the PM along with a recommendation for settlement and request a final decision on payment. The CE should notify the contractor of the PM final decision. If the decision involves an increase in time or money the CE should process a Contingency Allocation or Change Order.

Section 8.0 Quality Assurance and Control

The terms Quality Assurance (QA) and Quality Control (QC) are much confused and the terms, though distinctly different, are often interchanged and used as if they are the same. The following definitions of Quality Assurance and Quality Control are taken from ISO 8402 which is the International Standard referencing Quality Vocabulary. It is also important to define "Quality" so that we all understand what Quality Assurance and Quality Control are designed to produce.

Quality: The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs. In a contractual environment, needs are specified. Needs may include aspects of visibility, safety, availability, reliability, maintainability, economics and environment.

Quality Assurance: All those planned and systematic actions necessary to provide **adequate confidence** that a product or service will satisfy given requirements for quality. For effectiveness, quality assurance usually requires a continuing evaluation of factors that affect the design or specification for intended applications as well as verification and audits of production, installation, and inspection operations. Providing confidence will usually involve producing evidence.

Quality Control: The operational techniques and activities that are used to fulfill requirements for quality. Quality Control involves operational techniques and activities aimed both at monitoring a process and at eliminating causes of unsatisfactory performance at relevant stages of the quality loop in order to result in economic effectiveness.

In effect, Quality Control consists of those activities required to meet the specified requirements while Quality Assurance consists of those oversight activities that confirm and assure that Quality Control is in place and is effective.

8.1 RESPONSIBILITIES

It must first be firmly established that the Contractor is contractually responsible for the quality of the work and QA or QC activities performed by other parties in no way invalidate the Contractor's responsibility for quality. As such, the Contractor must have in place QC activities to ensure that quality requirements are met.

The QA/QC program will usually be under the direction of the CE. The CE will be assisted by trained and experienced inspectors capable of documenting the operation and results of the QA/QC program. The CE must have available qualified personnel or subconsultants for sampling and testing, for survey checks of the Contractor's work, and for other specialist QA/QC activities.

8.2 CONTRACTOR QUALITY CONTROL PLAN

If the construction contract specifically requires QC to be performed by the Contractor, the Contractor will be required to provide a CQC Plan. The CE should require early submittal of the CQC Plan before any construction work is begun. Normally, the contract will forbid commencement of any construction prior to approval of the CQC Plan.

QC Plans should be reviewed by the CE and discussed with the Contractor. When satisfactory, they should be copied to the Designer of Record (DOR). Compliance with the approved plan should be monitored and recorded.

8.3 INSPECTION

It is the duty of the CE and Inspectors to monitor and verify that the project is being constructed in accordance with the plans and specifications and in compliance with the terms of the contract. The Inspector has, and shall exercise, the authority to reject both unsatisfactory workmanship and materials. Such rejections must be made immediately upon discovery documented and

referenced to the appropriate plan or specification requirement. Documentation should include photographs where possible. However, the work shall not be directed to stop unless the non-conforming work will be covered up or the correction of the non-conforming work will have a critical impact on completion of the project.

The CE or CI will ensure that inspection of the work is so organized as to support the Contractor's schedule and that inspection forces are available and sufficient to meet the schedule. Every effort should be made to cooperate with the Contractor so that inspection activities will dovetail with the Contractor's work. The Inspection staff must be aware of the daily and weekly schedules provided by the Contractor and schedule their own work accordingly.

The Inspectors will provide daily inspection reports indicating work performed, inspections and tests carried out, non-conformances noted, and any other information relative to the quality of the work. Daily reports must be completed on City standard Inspector Daily Report Form per the attached instructions, be neat and legible, and fully describe the work performed.

Off-site inspections may be required. These will be scheduled by the CE with the Contractor. Inspectors shall provide details of inspections, tests, sampling performed, and conditions observed. Status of progress in fabrication/production and conformance with required schedule should be noted and the CE informed of any potential for delays due to quality or production problems.

Inspection staff is required to inspect all materials delivered to the work-site and to confirm that the materials meet the specified requirements. All incoming materials should have required documentation including certification that materials have been manufactured/processed in accordance with specified quality standards and passed all required inspections and tests. The Inspectors will check all such documentation and forward it to the field office for filing. Storage and protection of all delivered materials shall be checked periodically to ensure that there is no deterioration in the materials prior to incorporation in the work.

Inspectors are expected to be knowledgeable in the work, familiar with the contract plans, specifications and contract conditions, and experienced in the methods of installation. As such, the Inspection staff constitutes a valuable resource to the project. They will be called upon to assist in the interpretation of plans and specifications and can offer valuable insight on methods and techniques of construction. They must be careful not to direct the Contractor in means, methods, techniques, sequences, or procedures of construction or to make recommendations. Any advice requested and offered must be qualified with the statement that the Contractor, alone, is responsible for the construction of the work.

The inspectors are required to be familiar with the duties and responsibilities as stated in the CM Inspectors Manual when it becomes available and shall be familiar with standard practice and procedures for installation of the related work as referenced in other manuals provided to them by the CE.

8.4 TESTING

The CE and field staff shall schedule the subcontract testing services to ensure that their resources are planned and available. To the fullest extent possible, an Inspector should observe testing performed by the consultants and statutory agencies and document it on the daily report. Any test certificates issued must be safeguarded and filed.

Particular attention should be given to testing work or materials which will shortly thereafter be covered up or become otherwise inaccessible. Satisfactory testing results are required in order that follow-on work may proceed. The testing resources should be organized to be available as the work is installed and test results provided as soon as reasonably possible. Every effort should be made to cooperate with the Contractor.

Should the Contractor insist on covering work which has not been tested, the Contractor shall be informed, in writing by a Non-Compliance Notice, that such work is not acceptable, that no payment will be made for the work, that any costs associated with uncovering the work will be solely the responsibility of the Contractor, and that there will be no extension to the contract time as a result of uncovering untested work or work for which a test result was unsatisfactory.

Off-site testing may be conducted. The CE shall require the Contractor to provide adequate notice for all testing requirements.

Test results for all off-site testing should be received at the site before material/equipment is incorporated in the work. If the Contractor elects to use/install material/equipment without test results being available, the Contractor shall be notified that it will be entirely at the Contractor's risk and responsibility for any consequent costs or delays.

All test results are to be distributed to all required parties upon receipt and all test reports are to be maintained on file. The DOR should be consulted with regard to matters arising out of unsatisfactory test results.

8.5 COORDINATION WITH STATUTORY AUTHORITIES

The CE should be aware of other statutory authority's inspection and testing requirements. For installation of waterlines and sewer lines, CWW and MSD inspection and testing of installed work is required. For Traffic Engineering items the CE will inspect the initial installation and will call upon Traffic Engineering staff for support as needed and a final inspection is required by Traffic Engineering. For any work outside the right-of-way Building Department inspection and testing is required, including IBI inspection for electric work. For structures in the right-of-way that will have public occupancy, Building Department inspection and testing is required for life safety systems. For all other utility installations the CM staff is not responsible for the actual inspection of the utility itself but must check that line and grade is maintained per the approved drawings and all restoration is done in accordance with City standards.

8.6 SURVEY CONTROL

The standard City contract requires layout to be performed by the City. The CE and staff should require the contractor to give adequate notice of layout needs and schedule it accordingly with the survey crews so as not to cause delay in construction. Basic survey controls are to be protected and, as and when necessary, relocated.

There should be frequent checks on layout to confirm work is accurately installed. The CI and surveyors should do regular spot checks of measurements and elevations should be made including pile locations; foundation elevations; anchor bolts for structural framing and major equipment; rooms, recesses and closets to receive furniture, fixtures and equipment fabricated off-site; ceiling heights and space for utilities.

Final pay items that can be verified by survey should be final measured and documented by the survey crew at the completion of the project.

8.7 NON-COMPLYING WORK

The contract records shall indicate that non-conforming work was brought to the attention of the Contractor; that corrective action was taken by the Contractor to bring the work into compliance; that the corrective action was, where required, pre-approved by the DOR and CE; that the corrective action was observed and the finished work was re-inspected, re-tested or re-assessed and found to be in compliance.

In general, minor non-conformances can be verbally notified to the Contractor and correction observed and confirmed. Where verbal notification does not produce correction within a short period, written notification of non-compliance shall be issued. Where there is a major non-compliance, a written notification to the Contractor shall be issued. Where a test result does not

meet specified minimum requirements, a written notification of non-compliance for the work represented by the test result shall be issued.

Notification of non-conforming work shall be by means of a Non-Compliance Notice (NCN). The NCN shall identify the non-conforming work or non-compliance and, if re-work is extensive or complicated or time-consuming, shall require the Contractor to submit a proposal for corrective action. The corrective action proposal shall be reviewed by the DOR if required and the CE and, if acceptable, approval will be notified to the Contractor.

All NCNs shall be logged and tracked. The status of NCNs shall be discussed at Progress Meetings. The intent is that non-conforming work be corrected as quickly as possible. There may be a tendency, with some Contractors, to put off correcting defective work until late in the project in the hope that the work will be accepted as is in order to maintain schedule. The CE should not allow corrective action to be delayed and should refuse to approve for payment the maximum amount of work associated with the NCN. Any direct costs incurred by the City caused by non-conforming work should be the responsibility of the contractor.

8.8 QUALITY PROMOTION

The CE and field staff should work with Contractor's staff to promote a team approach to quality assurance and control, to inspection and testing, everyone working together towards a common goal of quality construction. Everyone should be made aware of the costs of poor quality, of the time and cost of re-work, of the negative effects on morale of having to tear out work that one has worked hard to install. The inspection/testing program should be seen as only one element in a total quality program designed to assist all participants in achieving superior levels of quality.

Section 9.0 Safety and Loss Control

The subject of safety on the construction project is complicated and requires diligent study by the CE. In general, the construction Contractor is **solely** responsible for safety of the work including work done or materials supplied by subcontractors, consultants, and vendors. This responsibility cannot be delegated to subcontractors, suppliers, or other persons. The Contractor is responsible for complying with the requirements for safety, accident prevention, and loss control contained in the construction contract and for compliance with all Federal, State, and Local Authority ordinances, regulations and standards applicable to the work.

All projects in the U.S. are subject to the Federal Occupational Health and Safety Act (OSHA) Sections 1910 and 1926.

9.1 CITY'S SAFETY PROGRAM

The CE and field staff shall maintain familiarity with the City's Employee Safety Instruction Manual. For Jobsite safety the CE shall be familiar with Sections 107.07 and 107.08 of the City Supplement.

9.2 CONTRACTOR'S SAFETY PLAN

1. At the Pre-Construction Conference, the Contractor should be instructed to submit a formal Safety Plan that meets the requirements of Sections 107.07 and 107.08 of the City Supplement.

The CE field staff should be familiar with the Contractor's Safety Plan and shall comply with the requirements of the Safety Plan when conducting their duties at the construction site. This will include use of personal protective equipment, using only designated accesses, obeying controlled access and lockout procedures, etc.

9.3 MONITORING COMPLIANCE WITH CONTRACT REQUIREMENTS

Safety should be an agenda item at the Progress Meetings and safety issues should be discussed and recorded in their minutes.

1. During normal inspection of the work for quality, quantity and progress purposes, if any major safety violations, unsafe practices or hazardous conditions become apparent, these should be noted in the Inspector Daily Report and the Contractor's nearest supervisor informed. The name of the person informed and the date and time should be noted in the report. The City of Cincinnati Construction Safety Memorandum and Construction Safety Hazard Notification forms (copies are in Appendix 1) should be used to document observations, hazards and deviations. Details of corrective action taken, and the date and time of the action should be noted in the report or a subsequent report. If corrective action does not begin within a short period (short being determined by the degree of exposure created by the condition) the Inspector must report the condition to the CE. The CE will immediately contact the Contractor and advise that corrective action should be instituted without delay. Copies of the City's forms and the Inspector's Daily Reports should be placed in the safety file.

The CE and staff should not attempt to inspect work to which there is not adequate and safe access. The Contractor should be notified that any work installed that is not inspected due to inadequate, unsafe access will not be included for payment.

2. Copies of all accident reports and other reports and statistics shall be required from the Contractor. CE will meet with the Contractor, if necessary, to review accident reports and determine if additions or amendments to the Contractor's Safety Plan need to be instituted. Changes to the Contractor's Safety Plan and other corrective actions shall be documented and copied to the safety file.

Appendix 2 Standard Filing System

USERS INSTRUCTIONS

In order to provide uniformity of procedures on construction contracts, a Standard File Index has been developed. For projects with multiple construction contracts, the contract number for each contract will precede the file numbers of the Standard File Index.

The Standard File Index has been developed around the Table of Contents of the Construction Management Manual. For instance, Section 7.0 of the CM Manual deals with Cost Control and cost control files are numbered 700 to 799 in the File Index. Similarly, Section 8.0 of the RE Manual deals with Quality Assurance and Control and all QA/QC files are numbered 800 to 899 in the File Index.

There are 11 sections in the updated CM Manual and there are 14 sections in the File Index. This is because there are more filing requirements than there are CM Manual requirements.

There is frequently a need for cross-filing documents under subject headings that relate to the actual work. To provide subject files, a 1300 series section has been provided for building-type contracts and a 1400 series section has been provided for highway, bridge and heavy construction type contracts.

The File Index has been developed to provide maximum flexibility within the standard procedure. Any file can be subdivided and sub-subdivided as the need arises. A wholly numerical numbering system is used for simplicity, using only standard numerals.

Most contracts maintain an additional Chronological File into which a copy or the original of all incoming and, sometimes, outgoing correspondence is placed. This is recommended and it is a matter of choice whether the original or a copy goes to the Chronological File, so long as the determination is made early and does not change.

In the event of a major accident, incident, or emergency, the CE shall notify the Principal Engineer as soon as possible.

9.4. CITIZENS' CLAIMS PROCEDURES

Upon receipt of a claim by a citizen asserting damage incurred as a result of construction activities, the CE will forward to the construction section's administrator to issue a City Notice of Claim form (copy in Appendix 1) to the Contractor. The CE will follow-up to ensure the Contractor investigates and provides a written response on the disposition of the matter within two weeks.

9.5 OTHER AGENCIES' CLAIMS PROCEDURES

The CE will administer claims by City agencies against the Contractor. The City's Notice of Emergency Repair Work by HMD (copy in Appendix 1) will be used in the event emergency repair work is performed to correct hazardous conditions created by the Contractor. The costs associated with claims by City agencies will be recovered in an appropriate manner, including deducting the costs from progress payments.

9.6 ENVIRONMENTAL ISSUES

In addition to safety of the individual, increasing emphasis is being placed on protection of the environment and the clean up of earlier degradation. Many elements that were common in construction, or were routinely buried as harmless wastes, are now recognized as hazardous materials and there are extensive and extending regulations governing the handling of these materials. Of particular concern in construction are asbestos, lead in paints or other materials, volatile organic compounds such as oil, petro-carbons, thinners, adhesives, etc., that give off potentially damaging fumes, and other exotic chemicals.

If suspected hazardous materials are encountered which were not expected, Project Manager and Principal Construction Engineer are to be immediately informed and authorization obtained to stop the work and make the area secure. The CE should contact the City Office of Environmental Management (OEM) to get direction on how the situation will be remediated. If costs are involved the CE should get approval from the Project Manager to proceed and check with the Engineering Accounting section to verify funds are available and certified. The CE should safeguard the health of the field staff by avoiding contact with the suspected hazardous materials until clear instructions are received.

Supervision, monitoring, and inspection of hazardous waste handling and remediation plans normally require special training and should be coordinate with the OEM. The CE will ensure that only suitably trained personnel are deployed on HAZMAT remediation work.

Section 10.0 Public Relations

We are in an age of ever-increasing public participation in the decision-making and oversight process of matters affecting construction projects. People are demanding the right to be involved in the conduct of works that affect their community. As a result, the CE should expect to be involved in matters of Public Relations and should be prepared to perform public relations activities in a manner that is consistent with the City policies.

The CE should, at the earliest stage of the project, become aware of aspects of the project that can be expected to impact negatively on the local community and develop strategies to minimize that impact. The CE should be acquainted with the history of the project, of concerns that have been raised, and any local personalities who have been involved in the planning of the project. It is useful to review back-copies of the local newspapers to get a feel for the public attitude towards the project and to be prepared to address particular concerns that may have been raised.

The most effective public relations tool is to conduct oneself in matters involving the public in a professional manner. Courtesy is of prime importance and every member of the public and their representatives must be treated with courtesy and respect. The CE and staff must not respond negatively to provocation but should remain calm and respectful at all times.

10.1 CONTACTS WITH THE CITY ADMINISTRATION AND COUNCIL

The CE must keep the Principal Construction Engineer aware of progress, potential problems and proposed action, and cost/schedule forecasts. The PE will seek to keep the City Administration and Council from being surprised by adverse citizen or media reports.

10.2 CONTACTS WITH THE PUBLIC

The CE and Inspectors should be known to local businesses and residences that will be most impacted by the presence of the project and they should feel that they can approach the CE and Inspectors with any complaints, questions or suggestions. The CI should note any contacts with the public on their Daily Report.

Legitimate complaints should be dealt with expeditiously by the CE and staff. If the complaint is regarding Contractor operations involving dust, mud, noise, obstruction, or trash accumulation, the Contractor should be instructed, to rectify the condition forthwith.

The CE should make use of a standard Right of Way Condition Report to document complaints. As complaints are resolved, the details, date, and time of corrective action can be recorded on the Form and maintained on file. Any other complaints received by other agencies should be acted upon promptly.

The CE should treat every complaint seriously and swift resolution of complaints will do a great deal for maintaining good community relations. Complaints about matters that one can do nothing about should be received sympathetically and, to the extent possible and prudent, explanation given as to why the problem cannot be mitigated. The complainant should be advised that every effort is being made to complete the work in the shortest possible time in order to remove the nuisance or concern at the earliest moment. Sometimes, a sympathetic ear is all that is needed.

10.3 CONTACTS WITH THE NEWS MEDIA

The CE in any contact with the news media must take great care and one should expect whatever one says to be selectively reported. If contacted by the Media the CE and Staff should decline comment and refer them to the Director of DOT&E and **immediately** contact the Director's office, the Principal Construction Engineer and the PM, and wait for direction before

making any comments. The CE should not provide any written documentation to the media unless it is requested in writing to the Director of Transportation.

10.4 ENHANCEMENT OF PUBLIC IMAGE

As the public takes more interest in matters affecting their community, public perception becomes more important to the construction process. Media and general public attention can be expected to focus more attentively on projects, particularly those that will have a major impact on the environment, public amenities, local economy and tax base. The CE and field staff need to give adequate attention to promoting and maintaining a positive and professional public image.

Section 11.0 Contract Completion and Closeout

Contract completion and closeout is a critical element in the life of a construction project. It is not unknown for a team to build up an excellent reputation during the construction process only to have that reputation destroyed by a poor closeout procedure. As the end of a project approaches, there can be a slackening off of control and attention to detail. The Contractor will often transfer key people to other projects and leave insufficient resources to supervise closeout. As the workload diminishes, it must be expected that the number of people on the project will be reduced, and this is normal and proper. What is essential is that there be a clearly defined closeout plan and procedures in place to allow the remaining staff to close out a project efficiently and effectively.

The time to start to plan the closeout of the project begins at the commencement of the project. The CE should, in the early days, begin to develop the closeout plan and procedures. This will begin with a thorough knowledge of the contract requirements relating to closeout. This will be followed by the insistence that the project schedule prepared by the Contractor includes all closeout activities and that the activities have adequate durations and resources assigned and that the logic and interfaces will permit timely conclusion.

Other major elements include insisting that non-conforming work be corrected within a reasonable period of notification. This will avoid a build up of punch list items at the end of the project. Closeout punch lists should only refer to work installed within the last few weeks.

As-built drawings should be checked monthly through the life of the project to ensure that they are marked up regularly and are current.

11.1 CLOSEOUT PROCEDURES

Each project will normally specify the closeout procedures in the construction contract. The CE should become thoroughly familiar with the closeout procedures at the beginning of the project and manage the project with close out in mind. The City's Closeout Checklist (copy in Appendix 1) should be used during planning and during the closeout process.

The CE shall prepare a punch list during the finish stages of a contract to indicate all work or corrective action remaining before acceptance of the project. A copy should be forward to the Project Manager and Design Engineer.

The Contractor shall submit to the CE a Certification of Completion, which indicates to the City that the contractor is ready for final inspection.

The CE shall do a final inspection. The PM should be encouraged to participate in the final inspection.

The CE shall establish a specific date of Substantial Completion and prepare a letter to the contractor to be signed by the Principal Engineer. The date of Substantial Completion is when the construction is sufficiently completed, in accordance with the contract documents, as modified by change orders agreed to by both parties and the owner can occupy or utilize the project for the specific intended use. This date also starts any applicable warranties required by the contractor. The date of commencement of warranties for items on the punch list will be the date of final payment unless otherwise agreed.

If a Substantial Completion date is after the contract completion date the CE must either apply liquidated damages or process a change order modifying the date.

The CE shall follow the policy for Post-Construction Inspection Evaluation (Copy Appendix 3).

11.2 AS-BUILT DRAWINGS and RECORD DRAWINGS

As-built, record, and utility drawings are an essential requirement of those who manage and maintain facilities. It is usually a requirement of the construction contract that the Contractor maintain these drawings and deliver them to the CE on completion of the project.

Whatever is required, the CE should take responsibility for ensuring that the complete as-built, record plans are delivered to appropriate Project Manager and receipt acknowledged in writing.

11.3 WARRANTIES, GUARANTEES, AND OPERATING START-UP

The technical specifications normally stipulate the requirements for warranties and guarantees. The CE should prepare a list of warranties and guarantees required by contract, including the format and periods of warranty/guarantee, as part of the Closeout Plan. Before project completion, the CE should begin coordinating with the Contractor the delivery of warranties/guarantees. The intent is to have all warranties/ guarantees in hand, properly bound, at contract completion, ready to transmit to the Client.

Warranties/guarantees usually become effective on the date of Substantial Completion. However, where equipment/systems are put into operation prior to contract completion, there may be some reluctance on the part of the equipment/system supplier to extend the warranty/guarantee period.

During the preparation of the Closeout Plan, the CE should review the construction contract documents to see if this issue is addressed. The contract may allow commencement of the warranty/guarantee period from date of start-up of equipment put into early use, particularly if this is for the benefit of the City.

If there is no provision in the contract, or if the contract clearly states that warranty/guarantee periods will commence on the date of final completion, the Contractor should be required to submit plans for maintaining the warranty/guarantee period on equipment/systems put to early use. This matter should be raised early in the contract before the Contractor has made final purchases of equipment/systems. The Contractor will then have the opportunity to negotiate extended warranties/guarantees.

Upon receipt of warranties/guarantees, they should be carefully reviewed to confirm that the warranty/guarantee is in accordance with the contract specification. Attention must be given to the fine print to ensure that there are no provisions that would limit or reduce the protection to the City as stipulated in the specifications. The CE will reject such warranties/guarantees and advise the Contractor that Final Certificate and Final Payment cannot be released until all warranties/guarantees are in conformance with the contract. All warranties shall be transmitted to the PM.

All City contracts have a standard one-year warranty. The CE shall arrange for a one-year warranty inspection prior to the expiration of this warranty

For projects with Mechanical and Electric equipment that require start up by the contractor, the CE should be familiar with those requirements and should notify the maintaining agent and PM of any training, and testing to be supplied by the contractor for operation start-up.

11.4 CONTRACTOR'S FINAL PAYMENT/FINAL ESTIMATE

Release of the Contractor's Final Payment/Final Estimate usually signifies the completion of the contract and the settlement of all outstanding issues. The construction contract will usually stipulate the requirements for release of final payment. The CE should be familiar with these requirements and incorporate them into the Closeout Plan. The Contractor should be thoroughly educated in these requirements well before contract completion and advised that all requirements for release of final payment must be met.

The Final Payment will take into account all changes to the contract. It is therefore important that change orders and claims be resolved as they arise and not put off until late in the contract. Early resolution of

changes and claims will contribute to a swift and efficient preparation of the Final Payment/Final Estimate documentation.

Release of Final Payment cannot occur until all contract requirements have been met and the CE must make certain that all requirements have been met in full accordance with the contract requirements. The ability to require Contractor compliance after release of Final Payment is severely diminished.

11.5 FINAL MEASUREMENT BY SURVEYORS

Final payment should include adjustments, if any are necessary, to reconcile progress payment quantities with final quantities established by survey. Any discrepancies between the Contractor's survey data and the City's surveying contractor must be reconciled. The CE and CI should coordinate the reconciliation.

11.6 CLOSEOUT DOCUMENTATION

For the CE, there are two phases to Closeout Documentation. The first phase is the documentation required from the Contractor prior to release of final payment. The second phase is the delivery of the total Document Record for the project to appropriate City representatives.

The contract conditions will specify the documentation required for closeout. This will usually include an affidavit of payment of payroll, materials, equipment, etc.; consent of surety to release of retainage and final payment; lien waivers; warranties and guarantees; operation and maintenance manuals, spare parts and as-built drawings. The CE should utilize the City's Closeout Checklist in coordinating the closeout.

The CE should institute procedures for documenting receipt of closeout documentation and marking off the checklist. The checklist should indicate any partial submittals, dates all submittals are required and when actually submitted by the Contractor. The CE should not recommend release of final payment until the checklist is complete.

The second phase of closeout documentation involves the transfer of the contract records. The project document records will include all files relevant to the project that will have been determined early in the project.

The CE will ensure that all document files are indexed and inventoried, securely boxed.

Prior to boxing, the CE and field office staff should carefully review the files and cull unnecessary duplicate copies. Caution must be exercised to prevent originals or only copies from being discarded. It is always to be preferred to ship more copies than required than to be missing one vital document.

11.7 ARCHIVING FILES AND DRAWINGS

Documents will be divided into two categories. Documents necessary for operation and maintenance of mechanical and electrical equipment will be provided to City representatives who are responsible for operating and maintaining the systems. Other documents related to the construction contract administration will be boxed properly with contents listed on inventory forms and box contents marked clearly. These contract administration documents will be sent to BIS for archiving.

CONTRACT #	FILE #	FILE SECTIONS
XXXXX	0 – 99	General Information
	100 – 199	Pre-Bid Procedures
	200-299	Award Procedures
	300-399	Construction Start-Up
	400-499	Communications Control
	500-599	Drawing Control
	600-699	Schedule Control
	700-799	Cost Control
	800 – 899	Quality Assurance and Control
	900 – 999	Safety & Loss Control
	1000 – 1099	Public Relations
	1100 – 1199	Contract Completion and Close-out
	1200 – 1299	EEO/AA/Payroll Records
	1300-1399	Subject Files – Building Contracts
	1400-1499	Subject Files – Highway, Bridge & Heavy Construction Contracts
	FILE #	FILE 0 – 99 GENERAL INFORMATION
	001	Consultant Agreements
	002	Construction Contract General Conditions, General Requirements, Special Provisions and Specifications
	003	City/Contractor Construction Contract
	010	Permits and Correspondence 010.1 Sub-file for each Permit
	011	Utility Agreements and Correspondence 011.1 Sub-file for each Utility
	012	Right-of-Way Agreements and Correspondence 012.1 Sub-file for each R.O.W Agreement
	013	Land Acquisition and Correspondence 013.1 Sub-file for each Parcel
	014	Survey Records 014.1 Survey Correspondence
	015	Agreements and Correspondence with other Statutory Authorities 015.1 Sub-file for each Statutory Authority
		FILE 100 – 199 PRE-BID PROCEDURES
	100	Constructibility Review
	101	Final Bid Document Review
	102	Invitation to Bid – Bidding Procedures
	103	Pre-Bid Conference – Minutes
	104	Addenda and Pre-Bid Correspondence
	105	Bidders Lists
	106	Prequalification 106.1 Sub-file for each bidder requesting prequalification
		FILE 200 – 299 AWARD PROCEDURES
	200	Bid Tabulations and Evaluations
	201	Pre-Award Conference – Minutes
	202	Execution of Contract Documents
	203	Notice of Award/Notice to Proceed
		FILE 300 – 399 CONSTRUCTION START-UP
	300	Pre-Service Conference – City/Designer – Minutes
	301	Pre-Construction Conference – Minutes – Correspondence
	302	Essential Personnel and Emergency Phone Numbers Lists
	303	Field Office/Workshop Layout Plans

304	Subcontractors – Approvals and Correspondence
304.1	Sub-file for each Subcontractor
305	Agreements between Contractor and Local Businesses/Land Owners
305.1	Sub-file for each Agreement
306	EEO/AA Compliance/Procedures
307	Correspondence/Complaints – Local Residents and Businesses – Subdivide as necessary
308	Suppliers – Approvals and Correspondence
308.1	Sub-file for each major supplier
330	Photographic Records
340	Contractor's Equipment Reports

FILE 400 – 499 COMMUNICATIONS CONTROL

401	Correspondence To/From Designer of Record
402	Correspondence To/From Contractor
403	Correspondence To/From Public Utilities
403.1	Sub-file for each Utility
404	Correspondence To/From Statutory Authorities
404.1	Sub-file for each Statutory Authority
405	Correspondence To/From Consultants
405.1	Sub-file for each Consultant
420	Inspectors Daily Reports (IDRS)
421	Weekly Construction Report
422	Monthly Construction Report
423	Chief Inspector Daily Report/Diary
424	Construction Engineer Daily Diary
425	Progress Meeting Minutes
426	Monthly Schedule Meeting Minutes
427	Agency/Utility Coordination Meeting Minutes
428	Other Meeting Minutes

FILE 500 – 599 DRAWING CONTROL

501	Drawing Distribution Transmittals
502	Shop Drawings, Working Drawings, Samples Submittals
503	Requests for Information/Clarification
504	As-Built Drawings
505	Field Sketches
506	Drawing Changes
510	Specifications
511	Specification Revisions

FILE 600 – 699 SCHEDULE CONTROL

601	Master Schedule Correspondence
602	Master Schedule Updates
603	Project Schedule Correspondence
604	Project Schedule Updates
605	Short Term Schedules

FILE 700 – 799 COST CONTROL

701	Payment Applications and Log
702	Payment Applications – Correspondence
703	Unit Prices
704	Schedule of Values (Lump Sum Billing Breakdowns)
705	Advance Payments for Materials
706	Quantity Records
706.1	Sub-file as necessary
707	Force Account Records

708	707.1 Sub-file as necessary Material Receiving Reports
710	708.1 Sub-file as necessary
711	Field Orders
712	Change Orders
	711.1 Sub-file for each Change Order
	Value Engineering Change Proposals
	712.1 Sub-file for each V.E.C.P.
713	Claims
	713.1 Sub-file for each Claim
714	Disputes Procedures
715	Disputes Resolution Board Correspondence
716	Disputes Resolution Board Meetings Minutes
720	Budgets, Funding, Cash Flow Reports – Subdivide as necessary

FILE 800 – 899 QUALITY ASSURANCE AND CONTROL

801	City QA/QC Plan and Correspondence
802	Contractor QC Plan and Correspondence
803	QA/QC Meeting Minutes
804	City Audit Reports
810	Inspection Correspondence
811	Off-Site Inspection Reports
812	Final Inspection Reports and Punch Lists
820	Testing Correspondence
	820.1 Testing Requirements
821	Geotechnical Test Reports
822	Earthwork Test Reports
	822.1 Compaction Tests
	822.2 CBRs
	822.3 Settlement Tests
823	Pile Test Reports
824	Concrete Test Reports
825	Sub-base Test Reports
826	Asphalt Test Reports
827	Sewer and Drain Test Reports
840	Site Visit Reports – Designer of Record
841	Site Visit Reports – City, County, State Inspectors
842	Site Visit Reports – Other Statutory Agencies
850	Survey Control Records
851	Deficiency/Deviation Acceptance Records
860	Non-Conformance Notices and Log
861	Quality Promotion Correspondence
862	Awards, Commendations, Recognitions
870	Partnering Procedures and Correspondence
871	Partnering Meeting Minutes
872	Partnering Training
873	Awards, Commendations, Recognitions

FILE 900 – 999 SAFETY AND LOSS CONTROL

901	City's Safety Plan and Correspondence
902	Contractor's Safety Plan and Correspondence
903	Minutes of Safety Meeting – City/Contractor
904	Contractor's Safety Meeting Minutes
905	Toolbox Safety Meetings – Agenda, Attendance, Reports
906	City Safety Inspection Reports
907	Contractor Safety Inspection Reports
908	OSHA/STATE Safety Inspection Reports

909 Insurer Safety Inspection Reports
 910 Safety Training & New Employee Orientation Records, City
 911 Safety Training and New Employee Orientation Records, Contractor
 912 Accident Reports
 920 Consultant Insurance Certificates
 921 Contractor/Subcontractor Insurance Certificates
 930 Stop Work Notices
 940 Safety Promotion
 950 City Controlled Insurance Plan
 970 Environmental Issues

FILE 1000 – 1099 PUBLIC RELATIONS

1001 City Community Relations Plan
 1002 Contacts with Public – Complaints, Queries, Notices, etc
 1003 Contacts with News Media – Interviews, Reports, Notices, etc.

FILE 1100 – 1199 CONTRACT COMPLETION & CLOSE-OUT

1101 Close-out Procedures
 1102 As-Built Drawings – Record Drawings
 1103 Equipment Start-up Correspondence
 1103.1 Start-up Procedures
 1103.2 Operator Training
 1103.3 Equipment Maintenance Records
 1104 Warranties and Guarantees
 1105 Spare Parts Lists
 1106 Certificate of Substantial Completion
 1106.1 Punch Lists
 1107 Certificate of Final Acceptance
 1107.1 Punch Lists
 1110 Final Estimate
 1120 Close-out Documentation
 1121 Contract Close-out Report
 1130 List of Contractors, Subcontractors, Vendors for Warranty/Maintenance Support

FILE 1200 – 1299 EEO/AA/DAVIS BACON FILES

1201 EEO/AA/DBE Requirements – Consultants
 1202 EEO/AA/DBE Requirements – Contractor
 1203 EEO Reports – Consultants
 1204 EEO Reports – Contractor
 1204.1 Sub-file for Subcontractors, as necessary
 1205 Certified Payrolls
 1205.1 Sub-file for each Subcontractor, as necessary
 1206 Training Records
 1206.1 Sub-file for each Subcontractor, as necessary
 1207 EEO/AA/DBE Audits

Building Projects

FILE 1300 – SUBJECT FILES

1302 Sitework
 1302.1 Sub-file by sub-title
 1303 Concrete
 1303.1 Sub-file by sub-title
 1304 Masonry
 1304.1 Sub-file by sub-title
 1305 Metals
 1305.1 Sub-file by sub-title
 1306 Wood and Plastics

- 1307 1306.1 Sub-file by sub-title
Thermal and Moisture Protection
- 1308 1307.1 Sub-file by sub-title
Doors and Windows
- 1309 1308.1 Sub-file by sub-title
Finishes
- 1310 1309.1 Sub-file by sub-title
Specialties
- 1311 1310.1 Sub-file by sub-title
Equipment
- 1312 1311.1 Sub-file by sub-title
Furnishings
- 1313 1312.1 Sub-file by sub-title
Special Construction
- 1314 1313.1 Sub-file by sub-title
Conveying Systems
- 1315 1314.1 Sub-file by sub-title
Mechanical
- 1316 1315.1 Sub-file by sub-title
Electrical
- 1316.1 Sub-file by sub-title

Highway, Bridge and Heavy Construction Contracts

FILE 1400 – SUBJECT FILES

- 1402 Grading
 - 1402.1 Erosion Control
 - 1402.2 Clearing and Grubbing
 - 1402.3 Earthwork
- 1403 Subgrade – Sub-bases – Bases
 - 1403.1 Lime Treated Subgrade
 - 1403.2 Cement-treated Subgrade
 - 1403.3 Aggregate Sub-Bases and Bases
 - 1403.4 Cement-treated Base
 - 1403.5 Lean Concrete Base
- 1404 Surface Treatments and Pavements
 - 1404.1 Portland Cement Concrete Pavement
 - 1404.2 Asphalt Pavements
- 1405 Drainage Facilities
 - 1405.1 Concrete Pipe
 - 1405.2 Metal Pipe
 - 1405.3 Plastic Pipe
 - 1405.4 Structures
- 1406 Utilities
 - 1406.1 Water
 - 1406.2 Sewer
 - 1406.3 Electrical
 - 1406.4 Gas
 - 1406.5 Telephone
 - 1406.6 CTV
- 1407 Structures
 - 1407.1 Concrete Piling
 - 1407.2 Steel Piling
 - 1407.3 Drilled Shafts
 - 1407.4 Concrete
 - 1407.5 Reinforcing Steel
 - 1407.6 Pre-stressing
 - 1407.7 Structural Steel

	1407.8	Painting
1408		Traffic Control
	1408.1	Maintenance of Traffic
	1408.2	Signs and Signals
	1408.3	Pavement Markings
	1408.4	Curb and Gutter
	1408.5	Barriers
	1408.6	Fencing
	1408.7	Guard Rail
	1408.8	Slope and Bank Protection
1409		Railroad
	1409.1	Insurance
1410		Transit and Subways

Develop further as necessary.

Standard Filing System Sub-File Request Form

Date _____

Full Name _____ Project _____

Contract Number _____

FILE #	FILE SECTIONS
0 – 99	General Information
100 – 199	Pre-Bid Procedures
200-299	Award Procedures
300-399	Construction Start-Up
400-499	Communications Control
500-599	Drawing Control
600-699	Schedule Control
700-799	Cost Control
800 – 899	Quality Assurance and Control
900 – 999	Safety & Loss Control
1000 – 1099	Public Relations
1100 – 1199	Contract Completion and Close-out
1200 – 1299	EEO/AA/Payroll Records
1300-1399	Subject Files – Building Contracts
1400-1499	Subject Files – Highway, Bridge & Heavy Construction Contracts

X	FILE #	FILE 0 – 99 GENERAL INFORMATION
<input type="checkbox"/>	001	Consultant Agreements
<input type="checkbox"/>	002	Construction Contract General Conditions, General Requirements, Special Provisions and Specifications
<input checked="" type="checkbox"/>	003	City/Contractor Construction Contract
<input type="checkbox"/>	010	Permits and Correspondence 010.1 Sub-file for each Permit
<input type="checkbox"/>	011	Utility Agreements and Correspondence 011.1 Sub-file for each Utility
<input type="checkbox"/>	012	Right-of-Way Agreements and Correspondence 012.1 Sub-file for each R.O.W Agreement
<input type="checkbox"/>	013	Land Acquisition and Correspondence 013.1 Sub-file for each Parcel
<input type="checkbox"/>	014	Survey Records 014.1 Survey Correspondence
<input type="checkbox"/>	015	Agreements and Correspondence with other Statutory Authorities 015.1 Sub-file for each Statutory Authority
<input type="checkbox"/>		
<input type="checkbox"/>		FILE 100 – 199 PRE-BID PROCEDURES
<input type="checkbox"/>	100	Constructability Review
<input type="checkbox"/>	101	Final Bid Document Review
<input type="checkbox"/>	102	Invitation to Bid – Bidding Procedures

<input type="checkbox"/>	103	Pre-Bid Conference – Minutes
<input checked="" type="checkbox"/>	104	Addenda and Pre-Bid Correspondence
<input type="checkbox"/>	105	Bidders Lists
<input type="checkbox"/>	106	Prequalification
<input type="checkbox"/>		106.1 Sub-file for each bidder requesting prequalification

FILE 200 – 299 AWARD PROCEDURES

<input checked="" type="checkbox"/>	200	Bid Tabulations and Evaluations
<input type="checkbox"/>	201	Pre-Award Conference – Minutes
<input type="checkbox"/>	202	Execution of Contract Documents
<input checked="" type="checkbox"/>	203	Notice of Award/Notice to Proceed

FILE 300 – 399 CONSTRUCTION START-UP

<input type="checkbox"/>	300	Pre-Service Conference – City/Designer – Minutes
<input checked="" type="checkbox"/>	301	Pre-Construction Conference – Minutes – Correspondence
<input checked="" type="checkbox"/>	302	Essential Personnel and Emergency Phone Numbers Lists
<input type="checkbox"/>	303	Field Office/Workshop Layout Plans
<input checked="" type="checkbox"/>	304	Subcontractors – Approvals and Correspondence
<input type="checkbox"/>		304.1 Sub-file for each Subcontractor
<input type="checkbox"/>	305	Agreements between Contractor and Local Businesses/Land Owners
<input type="checkbox"/>		305.1 Sub-file for each Agreement
<input type="checkbox"/>	306	EEO/AA Compliance/Procedures
<input checked="" type="checkbox"/>	307	Correspondence/Complaints Residents and Businesses – Subdivide as needed
<input type="checkbox"/>	308	Suppliers – Approvals and Correspondence
<input type="checkbox"/>		308.1 Sub-file for each major supplier
<input checked="" type="checkbox"/>	330	Photographic Records
<input type="checkbox"/>	340	Contractor's Equipment Reports

FILE 400 – 499 COMMUNICATIONS CONTROL

<input checked="" type="checkbox"/>	401	Correspondence To/From Designer of Record
<input checked="" type="checkbox"/>	402	Correspondence To/From Contractor
<input checked="" type="checkbox"/>	403	Correspondence To/From Public Utilities
<input type="checkbox"/>		403.1 Sub-file for each Utility
<input type="checkbox"/>	404	Correspondence To/From Statutory Authorities
<input type="checkbox"/>		404.1 Sub-file for each Statutory Authority
<input type="checkbox"/>	405	Correspondence To/From Consultants
<input type="checkbox"/>		405.1 Sub-file for each Consultant
<input checked="" type="checkbox"/>	420	Inspectors Daily Reports (IDRS)
<input type="checkbox"/>	421	Weekly Construction Report
<input checked="" type="checkbox"/>	422	Monthly Construction Report
<input type="checkbox"/>	423	Chief Inspector Daily Report/Diary
<input type="checkbox"/>	424	Construction Engineer Daily Diary
<input checked="" type="checkbox"/>	425	Progress Meeting Minutes
<input type="checkbox"/>	426	Monthly Schedule Meeting Minutes
<input type="checkbox"/>	427	Agency/Utility Coordination Meeting Minutes
<input checked="" type="checkbox"/>	428	Other Meeting Minutes

FILE 500 – 599 DRAWING CONTROL

<input checked="" type="checkbox"/>	501	Drawing Distribution Transmittals
<input checked="" type="checkbox"/>	502	Shop Drawings, Working Drawings, Samples Submittals
<input type="checkbox"/>	503	Requests for Information/Clarification
<input checked="" type="checkbox"/>	504	As-Built Drawings
<input checked="" type="checkbox"/>	505	Field Sketches
<input type="checkbox"/>	506	Drawing Changes

<input type="checkbox"/>	510	Specifications
<input type="checkbox"/>	511	Specification Revisions

FILE 600 – 699 SCHEDULE CONTROL

<input type="checkbox"/>	601	Master Schedule Correspondence
<input type="checkbox"/>	602	Master Schedule Updates
<input type="checkbox"/>	603	Project Schedule Correspondence
<input type="checkbox"/>	604	Project Schedule Updates
<input type="checkbox"/>	605	Short Term Schedules

FILE 700 – 799 COST CONTROL

<input type="checkbox"/>	701	Payment Applications and Log
<input type="checkbox"/>	702	Payment Applications – Correspondence
<input type="checkbox"/>	703	Unit Prices
<input type="checkbox"/>	704	Schedule of Values (Lump Sum Billing Breakdowns)
<input type="checkbox"/>	705	Advance Payments for Materials
<input type="checkbox"/>	706	Quantity Records
<input type="checkbox"/>	706.1	Sub-file as necessary
<input checked="" type="checkbox"/>	707	Force Account Records
<input type="checkbox"/>	707.1	Sub-file as necessary
<input type="checkbox"/>	708	Material Receiving Reports
<input type="checkbox"/>	708.1	Sub-file as necessary
<input type="checkbox"/>	710	Field Orders
<input checked="" type="checkbox"/>	711	Change Orders
<input type="checkbox"/>	711.1	Sub-file for each Change Order
<input type="checkbox"/>	712	Value Engineering Change Proposals
<input type="checkbox"/>	712.1	Sub-file for each V.E.C.P.
<input type="checkbox"/>	713	Claims
<input type="checkbox"/>	713.1	Sub-file for each Claim
<input type="checkbox"/>	714	Disputes Procedures
<input type="checkbox"/>	715	Disputes Resolution Board Correspondence
<input type="checkbox"/>	716	Disputes Resolution Board Meetings Minutes
<input type="checkbox"/>	720	Budgets, Funding, Cash Flow Reports – Subdivide as necessary

FILE 800 – 899 QUALITY ASSURANCE AND CONTROL

<input type="checkbox"/>	801	City QA/QC Plan and Correspondence
<input type="checkbox"/>	802	Contractor QC Plan and Correspondence
<input type="checkbox"/>	803	QA/QC Meeting Minutes
<input type="checkbox"/>	804	City Audit Reports
<input type="checkbox"/>	810	Inspection Correspondence
<input type="checkbox"/>	811	Off-Site Inspection Reports
<input checked="" type="checkbox"/>	812	Final Inspection Reports and Punch Lists
<input checked="" type="checkbox"/>	820	Testing Correspondence
<input type="checkbox"/>	820.1	Testing Requirements
<input type="checkbox"/>	821	Geotechnical Test Reports
<input type="checkbox"/>	822	Earthwork Test Reports
<input type="checkbox"/>	822.1	Compaction Tests
<input type="checkbox"/>	822.2	CBRs
<input type="checkbox"/>	822.3	Settlement Tests
<input type="checkbox"/>	823	Pile Test Reports
<input checked="" type="checkbox"/>	824	Concrete Test Reports
<input type="checkbox"/>	825	Sub-base Test Reports
<input checked="" type="checkbox"/>	826	Asphalt Test Reports
<input type="checkbox"/>	827	Sewer and Drain Test Reports

<input type="checkbox"/>	840	Site Visit Reports – Designer of Record
<input type="checkbox"/>	841	Site Visit Reports – City, County, State Inspectors
<input type="checkbox"/>	842	Site Visit Reports – Other Statutory Agencies
<input type="checkbox"/>	850	Survey Control Records
<input type="checkbox"/>	851	Deficiency/Deviation Acceptance Records
<input type="checkbox"/>	860	Non-Conformance Notices and Log
<input type="checkbox"/>	861	Quality Promotion Correspondence
<input type="checkbox"/>	862	Awards, Commendations, Recognitions
<input type="checkbox"/>	870	Partnering Procedures and Correspondence
<input type="checkbox"/>	871	Partnering Meeting Minutes
<input type="checkbox"/>	872	Partnering Training
<input type="checkbox"/>	873	Awards, Commendations, Recognitions

FILE 900 – 999 SAFETY AND LOSS CONTROL

<input type="checkbox"/>	901	City's Safety Plan and Correspondence
<input checked="" type="checkbox"/>	902	Contractor's Safety Plan and Correspondence
<input type="checkbox"/>	903	Minutes of Safety Meeting – City/Contractor
<input type="checkbox"/>	904	Contractor's Safety Meeting Minutes
<input type="checkbox"/>	905	Toolbox Safety Meetings – Agenda, Attendance, Reports
<input type="checkbox"/>	906	City Safety Inspection Reports
<input type="checkbox"/>	907	Contractor Safety Inspection Reports
<input type="checkbox"/>	908	OSHA/STATE Safety Inspection Reports
<input type="checkbox"/>	909	Insurer Safety Inspection Reports
<input type="checkbox"/>	910	Safety Training & New Employee Orientation Records, City
<input type="checkbox"/>	911	Safety Training and New Employee Orientation Records, Contractor
<input checked="" type="checkbox"/>	912	Accident Reports
<input type="checkbox"/>	920	Consultant Insurance Certificates
<input type="checkbox"/>	921	Contractor/Subcontractor Insurance Certificates
<input type="checkbox"/>	930	Stop Work Notices
<input type="checkbox"/>	940	Safety Promotion
<input type="checkbox"/>	950	City Controlled Insurance Plan
<input type="checkbox"/>	970	Environmental Issues

FILE 1000 – 1099 PUBLIC RELATIONS

<input type="checkbox"/>	1001	City Community Relations Plan
<input checked="" type="checkbox"/>	1002	Contacts with Public – Complaints, Queries, Notices, etc
<input type="checkbox"/>	1003	Contacts with News Media – Interviews, Reports, Notices, etc.

FILE 1100 – 1199 CONTRACT COMPLETION & CLOSE-OUT

<input checked="" type="checkbox"/>	1101	Close-out Procedures
<input checked="" type="checkbox"/>	1102	As-Built Drawings – Record Drawings
<input type="checkbox"/>	1103	Equipment Start-up Correspondence
<input type="checkbox"/>		1103.1 Start-up Procedures
<input type="checkbox"/>		1103.2 Operator Training
<input type="checkbox"/>		1103.3 Equipment Maintenance Records
<input type="checkbox"/>	1104	Warranties and Guarantees
<input type="checkbox"/>	1105	Spare Parts Lists
<input checked="" type="checkbox"/>	1106	Certificate of Substantial Completion
<input type="checkbox"/>		1106.1 Punch Lists
<input checked="" type="checkbox"/>	1107	Certificate of Final Acceptance
<input type="checkbox"/>		1107.1 Punch Lists
<input checked="" type="checkbox"/>	1110	Final Estimate
<input type="checkbox"/>	1120	Close-out Documentation
<input type="checkbox"/>	1121	Contract Close-out Report

<input type="checkbox"/>	1130	List of Contractors, Subcontractors, Vendors for Warranty/Maintenance Support
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<input type="checkbox"/>		FILE 1200 – 1299 EEO/AA/DAVIS BACON FILES
<input type="checkbox"/>	1201	EEO/AA/DBE Requirements – Consultants
<input type="checkbox"/>	1202	EEO/AA/DBE Requirements – Contractor
<input type="checkbox"/>	1203	EEO Reports – Consultants
<input type="checkbox"/>	1204	EEO Reports – Contractor
<input type="checkbox"/>		1204.1 Sub-file for Subcontractors, as necessary
<input type="checkbox"/>	1205	Certified Payrolls
<input type="checkbox"/>		1205.1 Sub-file for each Subcontractor, as necessary
<input type="checkbox"/>	1206	Training Records
<input type="checkbox"/>		1206.1 Sub-file for each Subcontractor, as necessary
<input type="checkbox"/>	1207	EEO/AA/DBE Audits

Building Projects

<input type="checkbox"/>		FILE 1300 – SUBJECT FILES
<input type="checkbox"/>	1302	Sitework
<input type="checkbox"/>		1302.1 Sub-file by sub-title
<input type="checkbox"/>	1303	Concrete
<input type="checkbox"/>		1303.1 Sub-file by sub-title
<input type="checkbox"/>	1304	Masonry
<input type="checkbox"/>		1304.1 Sub-file by sub-title
<input type="checkbox"/>	1305	Metals
<input type="checkbox"/>		1305.1 Sub-file by sub-title
<input type="checkbox"/>	1306	Wood and Plastics
<input type="checkbox"/>		1306.1 Sub-file by sub-title
<input type="checkbox"/>	1307	Thermal and Moisture Protection
<input type="checkbox"/>		1307.1 Sub-file by sub-title
<input type="checkbox"/>	1308	Doors and Windows
<input type="checkbox"/>		1308.1 Sub-file by sub-title
<input type="checkbox"/>	1309	Finishes
<input type="checkbox"/>		1309.1 Sub-file by sub-title
<input type="checkbox"/>	1310	Specialties
<input type="checkbox"/>		1310.1 Sub-file by sub-title
<input type="checkbox"/>	1311	Equipment
<input type="checkbox"/>		1311.1 Sub-file by sub-title
<input type="checkbox"/>	1312	Furnishings
<input type="checkbox"/>		1312.1 Sub-file by sub-title
<input type="checkbox"/>	1313	Special Construction
<input type="checkbox"/>		1313.1 Sub-file by sub-title
<input type="checkbox"/>	1314	Conveying Systems
<input type="checkbox"/>		1314.1 Sub-file by sub-title
<input type="checkbox"/>	1315	Mechanical
<input type="checkbox"/>		1315.1 Sub-file by sub-title
<input type="checkbox"/>	1316	Electrical
<input type="checkbox"/>		1316.1 Sub-file by sub-title

Highway, Bridge and Heavy Construction Contracts

<input type="checkbox"/>		FILE 1400 – SUBJECT FILES
<input type="checkbox"/>	1402	Grading
<input type="checkbox"/>		1402.1 Erosion Control
<input type="checkbox"/>		1402.2 Clearing and Grubbing
<input type="checkbox"/>		1402.3 Earthwork
<input type="checkbox"/>	1403	Subgrade – Sub-bases – Bases

		1403.1 Lime Treated Subgrade
		1403.2 Cement-treated Subgrade
		1403.3 Aggregate Sub-Bases and Bases
		1403.4 Cement-treated Base
		1403.5 Lean Concrete Base
	1404	Surface Treatments and Pavements
		1404.1 Portland Cement Concrete Pavement
		1404.2 Asphalt Pavements
	1405	Drainage Facilities
		1405.1 Concrete Pipe
		1405.2 Metal Pipe
		1405.3 Plastic Pipe
		1405.4 Structures
	1406	Utilities
X		1406.1 Water
		1406.2 Sewer
		1406.3 Electrical
		1406.4 Gas
		1406.5 Telephone
		1406.6 CTV
	1407	Structures
		1407.1 Concrete Piling
		1407.2 Steel Piling
		1407.3 Drilled Shafts
		1407.4 Concrete
		1407.5 Reinforcing Steel
		1407.6 Pre-stressing
		1407.7 Structural Steel
		1407.8 Painting
	1408	Traffic Control
		1408.1 Maintenance of Traffic
		1408.2 Signs and Signals
		1408.3 Pavement Markings
		1408.4 Curb and Gutter
		1408.5 Barriers
		1408.6 Fencing
		1408.7 Guard Rail
		1408.8 Slope and Bank Protection
	1409	Railroad
		1409.1 Insurance
	1410	Transit and Subways

Appendix 3 Policy for Post-Construction Project Evaluation

Department of Transportation and Engineering

The Department of Transportation and Engineering is continuously striving to improve and enhance the quality of projects implemented by the department. It is important that we learn from our experience of completed construction projects. Post construction evaluation of projects is one step in this direction. Considering many benefits of completed construction projects, the department has implemented a policy.

PURPOSE

- Continual improvement of design plans and specifications.
- Continual improvement of construction quality control.
- Improve communication between design engineers, construction engineers, and accounting staff.

BENEFITS

- Learn from design and construction deficiencies to minimize future problems.
- Create uniform expectations between designers and construction managers.
- Create more uniform design plans and specifications.

IMPLEMENTATION

- When each project is substantially complete, the construction engineer will notify the design team, the client agency or program manager, the city engineer, and the director and propose a time for the field review. The field review should be scheduled to allow time for completion of any punch list items identified.
- The construction engineer and project designer will prepare a joint report that:
 1. Identifies design or construction problems encountered.
 2. Describes how the problems -were solved on the project.
 3. Makes recommendations for changes to future design plans or specifications, further investigations, or training.
- The report will be distributed to the design team, the construction team, and the principal design and principal construction engineer. The principal engineers will distribute the reports for further action if needed or informational purposes.

Approved

John Deatrick,
Director of Transportation and Engineering